

## 10/594,489-266327-EIC 1700 SEARCH

SEARCH

=&gt; d his 160

(FILE 'HCAPLUS' ENTERED AT 10:29:22 ON 29 JUL 2008)

L60 34 S L56 AND (L15-L18 OR L21)  
SAV TEMP L60 WEI459HCP/A

=&gt; d que 160

L2 3 SEA FILE=REGISTRY ABB=ON PLU=ON (372492-00-7/BI OR  
477700-15-5/BI OR 866331-36-4/BI)  
L4 72683 SEA FILE=REGISTRY ABB=ON PLU=ON (LI(L)O(L)M)/ELS(L)3-  
6/ELC.SUB  
L5 QUE ABB=ON PLU=ON 3/ELC.SUB  
L6 4104 SEA FILE=REGISTRY ABB=ON PLU=ON L4 AND L5  
L7 297 SEA FILE=REGISTRY ABB=ON PLU=ON L6 AND .01-9/CO  
L8 8 SEA FILE=REGISTRY ABB=ON PLU=ON (LI(L)O(L)CO(L)ZR(L)M  
G)/ELS(L)5/ELC.SUB  
L9 995 SEA FILE=REGISTRY ABB=ON PLU=ON (LI(L)O(L)CO(L)NI(L)M  
N)/ELS(L)5/ELC.SUB  
L10 3 SEA FILE=REGISTRY ABB=ON PLU=ON L2 AND L4  
L12 6 SEA FILE=REGISTRY ABB=ON PLU=ON (LI(L)O(L)CO(L)ZR(L)M  
G(L)M)/ELS(L)6/ELC.SUB  
L13 5 SEA FILE=REGISTRY ABB=ON PLU=ON L12 AND (AL OR TI OR  
SN)  
L14 24 SEA FILE=REGISTRY ABB=ON PLU=ON (LI(L)O(L)CO(L)ZR(L)M  
G(L)M)/ELS  
L15 13 SEA FILE=HCAPLUS ABB=ON PLU=ON L13  
L16 14 SEA FILE=HCAPLUS ABB=ON PLU=ON L12  
L17 48 SEA FILE=HCAPLUS ABB=ON PLU=ON L10  
L18 25 SEA FILE=HCAPLUS ABB=ON PLU=ON L8  
L19 6603 SEA FILE=HCAPLUS ABB=ON PLU=ON L7  
L20 1237 SEA FILE=HCAPLUS ABB=ON PLU=ON L9  
L21 43 SEA FILE=HCAPLUS ABB=ON PLU=ON L14  
L22 25 SEA FILE=HCAPLUS ABB=ON PLU=ON L21 AND L18  
L23 237753 SEA FILE=HCAPLUS ABB=ON PLU=ON "BATTERY CATHODES"+MAX  
/CT  
L24 13 SEA FILE=HCAPLUS ABB=ON PLU=ON L23 AND L16  
L25 7511 SEA FILE=HCAPLUS ABB=ON PLU=ON ((L15 OR L16 OR L17  
OR L18 OR L19 OR L20 OR L21 OR L22) OR L24)  
L26 7286 SEA FILE=HCAPLUS ABB=ON PLU=ON L25 AND L23  
L27 15324 SEA FILE=HCAPLUS ABB=ON PLU=ON "SECONDARY BATTERY  
CATHODES"+MAX/CT  
L30 200884 SEA FILE=HCAPLUS ABB=ON PLU=ON "SECONDARY BATTERIES"+  
MAX/CT OR (SECONDAR? OR LITHIUM OR LI)(2A)BATTER?  
L31 QUE ABB=ON PLU=ON CATHOD? OR POSITIVE(A)ELECTROD?  
L32 QUE ABB=ON PLU=ON "SECONDARY BATTERY ANODES"+MAX/CT  
OR ANOD? OR NEGATIVE(A)ELECTROD?  
L33 QUE ABB=ON PLU=ON ELECTROLYT?(2A)(NONAQ? OR NON(W)AQ  
UEOUS OR ORGANIC)  
L34 5921 SEA FILE=HCAPLUS ABB=ON PLU=ON L30 AND (L31 OR L23  
OR L27) AND L32 AND L33  
L35 1321 SEA FILE=HCAPLUS ABB=ON PLU=ON L26 AND L34  
L36 11 SEA FILE=HCAPLUS ABB=ON PLU=ON L35 AND (L18 OR L21)  
L37 QUE ABB=ON PLU=ON LAYER?  
L38 362 SEA FILE=HCAPLUS ABB=ON PLU=ON L35 AND L37  
L39 7 SEA FILE=HCAPLUS ABB=ON PLU=ON L36 AND L37  
L40 QUE ABB=ON PLU=ON PARTICLES+MAX/CT  
L43 14 SEA FILE=HCAPLUS ABB=ON PLU=ON L38 AND L40  
L44 QUE ABB=ON PLU=ON PARTICL? OR MICROPARTICL? OR PARTI  
CULAT? OR DUST? OR GRIT? OR GRAIN# OR GRANUL? OR POWDER  
? OR SOOT? OR SMUT? OR FINES# OR PRILL? OR FLAKE# OR PE  
LLET?  
L45 76 SEA FILE=HCAPLUS ABB=ON PLU=ON L38 AND L44  
L46 14 SEA FILE=HCAPLUS ABB=ON PLU=ON L20 AND (L18 OR L21)  
L48 4 SEA FILE=HCAPLUS ABB=ON PLU=ON L46 AND L38

# 10/594,489-266327-EIC 1700 SEARCH

L49	4	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L46 AND L35
L50	27	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L20 AND (L15 OR L16 OR L17 OR L18 OR L21)
L51	6	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L50 AND (L38 OR L45)
L52	16	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L17 AND L20
L53	16	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L52 AND L30 AND (L23 OR L27 OR L31)
L54	12	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L53 AND L33
L55	40	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L36 OR L39 OR L43 OR (L48 OR L49) OR (L51 OR L52 OR L53 OR L54)
L56	48	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L50 OR L55
L60	34	SEA FILE=HCAPLUS	ABB=ON	PLU=ON	L56 AND ((L15 OR L16 OR L17 OR L18) OR L21)

## 10/594,489-266327-EIC 1700 SEARCH

SEARCH RESULTS

=&gt; d 160 1-34 ibib ed abs hitstr hitind

L60 ANSWER 1 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2008:701893 HCAPLUS Full-text

DOCUMENT NUMBER: 149:13849

TITLE: Nonaqueous electrolyte  
secondary batteries with  
mixed oxide cathodes

INVENTOR(S): Yamamoto, Satoshi; Nishida, Nobumichi

PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 12pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2008135245	A	20080612	JP 2006-319534	2006 1128

PRIORITY APPLN. INFO.:	JP 2006-319534	2006 1128
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ED Entered STN: 12 Jun 2008

AB The title batteries include cathodes containing (a) 10-60 weight%  $\text{Li}_x\text{Ni}_{1-x-y}\text{Co}_y\text{Mn}_1\text{yO}_2$  ( $a = 0-1.2$ ;  $0 < x$ ;  $0 \leq y$ ;  $x + y \leq 0.4$ ; M1 contains Al and/or Mn), (b)  $\text{Li}_x\text{Co}_{1-s}\text{Mg}_s\text{O}_2$  ( $b = 0-1.1$ ;  $s = 0.01-0.05$ ; M2 contains Mg, Al, Ti, Mn, and/or Zr), and (c)  $\text{Li}_x\text{Mn}_t\text{Ni}_u\text{Co}_v\text{Mg}_w\text{O}_2$  ( $c = 0-1.2$ ;  $t = 0.1-0.5$ ;  $u = 0.1-0.5$ ;  $0 \leq v$ ;  $w = 0-0.03$ ;  $t + u + v + w = 1$ ;  $t/u = 0.95-1.05$ ; M3 contains Mg, Al, Ti, and/or Zr). Preferably, the cathodes contain  $\geq 10$  weight% c. The batteries have large capacity and show excellent charge-discharge characteristics.

IT 203005-82-7P, Cobalt lithium manganese nickel oxide

(Co<sub>0.15</sub>LiMn<sub>0.05</sub>Ni<sub>0.80</sub>O<sub>2</sub>) 372492-00-7P, Aluminum cobaltlithium magnesium oxide (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>)

493326-93-5P, Cobalt lithium manganese nickel oxide

(Co<sub>0.33</sub>LiMn<sub>0.34</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 868842-82-4P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(nonaq. electrolyte secondary

batteries with cathodes containing Ni Co mixed

oxides, Li Co mixed oxides, and Li Mn Ni Co mixed oxides)

RN 203005-82-7 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co<sub>0.15</sub>LiMn<sub>0.05</sub>Ni<sub>0.80</sub>O<sub>2</sub>) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O	2	17778-80-2
Co	0.15	7440-48-4
Ni	0.8	7440-02-0
Mn	0.05	7439-96-5
Li	1	7439-93-2

RN 372492-00-7 HCAPLUS

CN Aluminum cobalt lithium magnesium oxide (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number

## 10/594,489-266327-EIC 1700 SEARCH

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.98	7440-48-4
Mg	0.01	7439-95-4
Li	1	7439-93-2
Al	0.01	7429-90-5

RN 493326-93-5 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co0.33LiMn0.34Ni0.33O2)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.33	7440-48-4
Ni	0.33	7440-02-0
Mn	0.34	7439-96-5
Li	1	7439-93-2

RN 868842-82-4 HCAPLUS

CN Aluminum cobalt lithium magnesium zirconium oxide  
(Al0.01Co0.97LiMg0.01Zr0.01O2) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Zr	0.01	7440-67-7
Co	0.97	7440-48-4
Mg	0.01	7439-95-4
Li	1	7439-93-2
Al	0.01	7429-90-5

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST nonaq electrolyte secondary  
battery cathode; nickel cobalt lithium manganese  
lithium mixed oxide cathode; cobalt lithium mixed oxide  
cathode nonaq secondary battery;  
lithium nickel cobalt mixed oxide cathode nonaq  
secondary batteryIT Secondary batteries  
(lithium; nonaq. electrolyte  
secondary batteries with cathodes  
containing Ni Co mixed oxides, Li Co mixed oxides, and Li Mn Ni Co  
mixed oxides)IT Battery cathodes  
(nonaq. electrolyte secondary  
batteries with cathodes containing Ni Co mixed  
oxides, Li Co mixed oxides, and Li Mn Ni Co mixed oxides)IT 113066-89-0P, Cobalt lithium nickel oxide (Co0.2LiNi0.8O2)  
RL: IMF (Industrial manufacture); TEM (Technical or engineered  
material use); PREP (Preparation); USES (Uses)  
(nonaq. electrolyte secondary  
batteries with cathodes containing Ni Co mixed  
oxides, Co mixed oxides, and Mn Ni Co mixed oxides)IT 193214-24-3P, Aluminum cobalt lithium nickel oxide  
(Al0.05Co0.15LiNi0.8O2) 203005-82-7P, Cobalt lithium  
manganese nickel oxide (Co0.15LiMn0.05Ni0.8O2)  
372492-00-7P, Aluminum cobalt lithium magnesium oxide  
(Al0.01Co0.98LiMg0.01O2) 493326-93-5P, Cobalt lithium  
manganese nickel oxide (Co0.33LiMn0.34Ni0.33O2)  
868842-82-4P 1030313-66-6P  
RL: IMF (Industrial manufacture); TEM (Technical or engineered  
material use); PREP (Preparation); USES (Uses)  
(nonaq. electrolyte secondary  
batteries with cathodes containing Ni Co mixed

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oxides, Li Co mixed oxides, and Li Mn Ni Co mixed oxides)

L60 ANSWER 2 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2008:635720 HCAPLUS Full-text  
 DOCUMENT NUMBER: 148:589350  
 TITLE: Secondary nonaqueous  
 electrolyte lithium  
 battery having two-layer  
 separator with controlled gas permeability  
 INVENTOR(S): Yamashita, Noriko; Iwanaga, Masato  
 PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 12pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2008123861	A	20080529	JP 2006-307012	2006 1113

PRIORITY APPLN. INFO.: JP 2006-307012  
 2006  
 1113

ED Entered STN: 29 May 2008

AB The secondary nonaq. electrolyte battery contains cathode active materials having potential (Li standard) 4.4-5.1 V and a separator comprising 2 layers, the layer at the cathode side and that at the anode side having gas permeability 250-400 and 60-200 s/100 mL, resp. Preferably, the cathode active materials in the battery are mixts. containing Li Co mixed oxides comprising LiCoO<sub>2</sub>, Zr, and Mg and layered Li Mn Ni oxides, and the anode active materials are carbonaceous materials. The battery shows high capacity after repeated cycles and high-temperature storage after charging.

IT 642999-33-5P, Cobalt lithium magnesium zirconium oxide  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (cathode containing; secondary nonaq.  
 electrolyte Li battery having 2-  
 layer separator with different gas permeabilities at  
 cathode and anode sides)

RN 642999-33-5 HCAPLUS

CN Cobalt lithium magnesium zirconium oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Zr	x	7440-67-7
Co	x	7440-48-4
Mg	x	7439-95-4
Li	x	7439-93-2

IT 12190-79-3, Cobalt lithium oxide (CoLiO<sub>2</sub>)  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (cathode containing; secondary nonaq.  
 electrolyte Li battery having 2-  
 layer separator with different gas permeabilities at  
 cathode and anode sides)

RN 12190-79-3 HCAPLUS

CN Cobalt lithium oxide (CoLiO<sub>2</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
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## 10/594,489-266327-EIC 1700 SEARCH

O		2		17778-80-2
Co		1		7440-48-4
Li		1		7439-93-2

IT 532934-38-6P, Cobalt lithium manganese nickel oxide  
(Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(layered, cathode containing; secondary nonaq. electrolyte Li battery having 2-layer separator with different gas permeabilities at cathode and anode sides)

RN 532934-38-6 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
(CA INDEX NAME)

Component		Ratio		Component Registry Number
O		2		17778-80-2
Co		0.34		7440-48-4
Ni		0.33		7440-02-0
Mn		0.33		7439-96-5
Li		1		7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 49

ST nonaq electrolyte lithium  
battery separator gas permeability; cathode  
lithium oxide battery separator gas  
permeability; anode carbon lithium  
battery separator gas permeability

IT Carbonaceous materials (technological products)  
RL: TEM (Technical or engineered material use); USES (Uses)  
(anode; secondary nonaq. electrolyte Li battery having 2-layer separator with different gas permeabilities at cathode and anode sides)

IT Secondary batteries  
(lithium; secondary nonaq. electrolyte Li battery having 2-layer separator with different gas permeabilities at cathode and anode sides)

IT Battery anodes  
Battery cathodes  
Secondary battery separators  
(secondary nonaq. electrolyte Li battery having 2-layer separator with different gas permeabilities at cathode and anode sides)

IT Laminated plastics, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(separator; secondary nonaq. electrolyte Li battery having 2-layer separator with different gas permeabilities at cathode and anode sides)

IT 7782-42-5, Graphite, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(anode; secondary nonaq. electrolyte Li battery having 2-layer separator with different gas permeabilities at cathode and anode sides)

IT 7439-95-4, Magnesium, uses 7440-67-7, Zirconium, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(cathode containing lithium cobalt oxide containing; secondary nonaq. electrolyte Li

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battery having 2-layer separator with  
different gas permeabilities at cathode and  
anode sides)

- IT 642999-33-5P, Cobalt lithium magnesium zirconium oxide  
RL: IMF (Industrial manufacture); TEM (Technical or engineered  
material use); PREP (Preparation); USES (Uses)  
(cathode containing; secondary nonaq.  
electrolyte Li battery having 2-  
layer separator with different gas permeabilities at  
cathode and anode sides)
- IT 12190-79-3, Cobalt lithium oxide (CoLiO<sub>2</sub>)  
RL: TEM (Technical or engineered material use); USES (Uses)  
(cathode containing; secondary nonaq.  
electrolyte Li battery having 2-  
layer separator with different gas permeabilities at  
cathode and anode sides)
- IT 9002-88-4, Polyethylene  
RL: TEM (Technical or engineered material use); USES (Uses)  
(laminated, separator; secondary nonaq.  
electrolyte Li battery having 2-  
layer separator with different gas permeabilities at  
cathode and anode sides)
- IT 532934-38-6P, Cobalt lithium manganese nickel oxide  
(Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
RL: IMF (Industrial manufacture); TEM (Technical or engineered  
material use); PREP (Preparation); USES (Uses)  
(layered, cathode containing; secondary  
nonaq. electrolyte Li  
battery having 2-layer separator with  
different gas permeabilities at cathode and  
anode sides)

L60 ANSWER 3 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2008:612100 HCAPLUS Full-text  
DOCUMENT NUMBER: 148:565392  
TITLE: Non-aqueous  
electrolyte secondary cell  
INVENTOR(S): Yamamoto, Satoshi; Nishida, Nobumichi  
PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan  
SOURCE: Eur. Pat. Appl., 13pp.  
CODEN: EPXXDW  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1923938	A1	20080521	EP 2007-120633	2007 1114
R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LI, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR, AL, BA, HR, MK, RS				
JP 2008123972	A	20080529	JP 2006-309799	2006 1116
KR 2008044751	A	20080521	KR 2007-77019	2007 0731
CN 101183711	A	20080521	CN 2007-10142419	2007 0822
US 20080118839	A1	20080522	US 2007-941252	2007 1116

## 10/594,489-266327-EIC 1700 SEARCH

PRIORITY APPLN. INFO.:

JP 2006-309799

A

2006

1116

ED Entered STN: 22 May 2008

AB The present disclosure aims to provide a non-aq. electrolyte secondary cell having high capacity and capable of preventing elution of cobalt and decomposition of the electrolyte. This aim can be accomplished by providing a non-aqueous electrolyte secondary cell comprising a pos. electrode having a pos. electrode active material, a neg. electrode having a neg. electrode active material, and non-aqueous electrolyte, wherein the pos. electrode active material comprises lithium cobalt oxide to which at least one material selected from the group consisting of Mg, Al, Ti, and Zr was added, and the pos. electrode comprises lithium phosphate.

IT 756879-33-1

RL: TEM (Technical or engineered material use); USES (Uses)  
(pos. electrode component; non-aqueous electrolyte secondary cell)

RN 756879-33-1 HCAPLUS

CN Aluminum cobalt lithium magnesium zirconium oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Zr	x	7440-67-7
Co	x	7440-48-4
Mg	x	7439-95-4
Li	x	7439-93-2
Al	x	7429-90-5

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST nonaq electrolyte secondary cell pos  
electrode active material

IT Styrene-butadiene rubber, uses

RL: TEM (Technical or engineered material use); USES (Uses)  
(binder, neg. electrode component;  
non-aqueous electrolyte secondary cell)

IT Secondary batteries  
(lithium; non-aqueous  
electrolyte secondary cell)

IT Battery electrodes  
(non-aqueous electrolyte secondary  
cell)

IT Fluoropolymers, uses

RL: TEM (Technical or engineered material use); USES (Uses)  
(non-aqueous electrolyte secondary  
cell)

IT 24937-79-9, PvdF

RL: TEM (Technical or engineered material use); USES (Uses)  
(binder, pos. electrode component;  
non-aqueous electrolyte secondary cell)

IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate  
21324-40-3, Lithium hexafluorophosphate

RL: TEM (Technical or engineered material use); USES (Uses)  
(electrolyte component; non-aqueous  
electrolyte secondary cell)

IT 7440-50-8, Copper, uses

RL: TEM (Technical or engineered material use); USES (Uses)  
(foil, neg. electrode substrate;  
non-aqueous electrolyte secondary cell)

IT 7429-90-5, Aluminum, uses

RL: TEM (Technical or engineered material use); USES (Uses)  
(foil, pos. electrode substrate;  
non-aqueous electrolyte secondary cell)

IT 7782-42-5, Graphite, uses

RL: TEM (Technical or engineered material use); USES (Uses)  
(neg. electrode component; non-

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aqueous electrolyte secondary cell)

IT 10377-52-3, Lithium phosphate.  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (neg. electrode material; non-  
 aqueous electrolyte secondary cell)

IT 60-29-7, Diethyl ether, uses 96-48-0,  $\gamma$ -Butyrolactone  
 105-58-8, Diethyl carbonate 108-29-2,  $\gamma$ -Valerolactone  
 108-32-7, Propylene carbonate 109-99-9, Tetrahydrofuran, uses  
 110-71-4, 1, 2-Dimethoxyethane 623-53-0, Ethyl methyl carbonate  
 4437-85-8, Butylene carbonate 9000-11-7, Carboxymethyl cellulose  
 13436-45-8, 2-Methoxytetrahydrofuran 90076-65-6, Lithium  
 bis(trifluoromethanesulfonyl)imide 132843-44-8 154838-53-6,  
 Aluminum cobalt lithium oxide 198213-59-1, Aluminum cobalt  
 lithium oxide (Al<sub>0.05</sub>Co<sub>0.95</sub>LiO<sub>2</sub>) 253868-42-7, Cobalt lithium  
 magnesium titanium oxide 265652-42-4, Aluminum cobalt lithium  
 oxide (Al<sub>0.03</sub>Co<sub>0.97</sub>LiO<sub>2</sub>) 345664-05-3, Aluminum cobalt lithium  
 oxide (Al<sub>0.01</sub>Co<sub>0.99</sub>LiO<sub>2</sub>) 642999-49-3, Aluminum cobalt lithium  
 magnesium oxide 678159-00-7, Aluminum cobalt lithium zirconium  
 oxide  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (non-aqueous electrolyte secondary  
 cell)

IT 872-50-4, n-2-Methyl-pyrrolidone, uses 198213-70-6, Cobalt  
 lithium magnesium oxide (Co<sub>0.98</sub>LiMg<sub>0.02</sub>O<sub>2</sub>) 253875-50-2, Cobalt  
 lithium titanium oxide (Co<sub>0.98</sub>LiTi<sub>0.02</sub>O<sub>2</sub>) 459409-01-9, Aluminum  
 cobalt lithium oxide (Al<sub>0.02</sub>Co<sub>0.98</sub>LiO<sub>2</sub>) 756879-33-1  
 867249-18-1, Cobalt lithium zirconium oxide (Co<sub>0.98</sub>LiZr<sub>0.02</sub>O<sub>2</sub>)  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (pos. electrode component; non-  
 aqueous electrolyte secondary cell)

IT 7440-44-0, Carbon, uses  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (powder, pos. electrode component;  
 non-aqueous electrolyte secondary cell)

IT 9003-55-8  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (styrene-butadiene rubber, binder, neg.  
 electrode component; non-aqueous  
 electrolyte secondary cell)

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE  
 FOR THIS RECORD. ALL CITATIONS AVAILABLE  
 IN THE RE FORMAT

L60 ANSWER 4 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2008:316956 HCAPLUS Full-text

DOCUMENT NUMBER: 148:335039

TITLE: Fluorinated cathode active material  
 and its manufacture for cathode and  
 secondary nonaqueous  
 electrolyte battery

INVENTOR(S): Morita, Koji; Yamaguchi, Hiroyuki; Nakai,  
 Hideki; Isakane, Masayoshi

PATENT ASSIGNEE(S): Sony Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 23pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2008060033	A	20080313	JP 2006-238791	2006 0904

## 10/594,489-266327-EIC 1700 SEARCH

PRIORITY APPLN. INFO.:

JP 2006-238791

2006

0904

ED Entered STN: 13 Mar 2008

AB The active material is a mixed metal oxide particle having average composition represented as  $\text{Li}_p\text{Ni}_{(1-q-r)}\text{Mn}_q\text{Mg}_r\text{O}_{(2-y)}\text{X}_z$  (M1 = Group 2-15 elements except Ni and Mn;  $X = \text{F}$ ;  $p = 0-1.5$ ;  $q = 0-1.0$ ;  $r = 0-1.0$ ;  $y = -0.10$  to  $0.20$ ;  $0 < z \leq 0.2$ ) and peak intensity ratio of  $\text{LiMeF}^+/\text{LiMeO}^+$  (Me = Group 2-15 elements) at the particle cross section 0.01-0.3 by TOF-SIMS, where  $\text{LiMeF}^+$  exists at center of the particle. The mixed metal oxide particle is manufactured by fluorination under high temperature of an oxide particle represented as  $\text{Li}_p\text{Ni}_{(1-q-r)}\text{Mn}_q\text{Mg}_r\text{O}_{(2-y)}$  (M1 = Group 2-15 elements except Ni and Mn;  $p = 0-1.5$ ;  $q = 0-1.0$ ;  $r = 0-1.0$ ;  $y = -0.10$  to  $0.20$ ) or  $\text{Li}_{(1+p)}\text{Co}_{(1-q)}\text{Mg}_q\text{O}_{(2-y)}$  (M = Group 2-15 elements except Co;  $p = -0.10$  to  $0.10$ ;  $0 \leq q < 0.3$ ;  $y = -0.10$  to  $0.20$ ). The secondary battery equipped with a cathode containing the active material provides long cycle life.

IT 346417-97-8DP, Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.33}\text{LiMn}_{0.33}\text{Ni}_{0.33}\text{O}_2$ ), fluorinated 372492-00-7DP, Aluminum cobalt lithium magnesium oxide ( $\text{Al}_{0.01}\text{Co}_{0.98}\text{LiMg}_{0.01}\text{O}_2$ ), fluorinated

RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(manufacture of fluorinated cathode active material for cathode and secondary nonaq. electrolyte battery)

RN 346417-97-8 HCAPLUS

CN Cobalt lithium manganese nickel oxide ( $\text{Co}_{0.33}\text{LiMn}_{0.33}\text{Ni}_{0.33}\text{O}_2$ )  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	0.33	7440-48-4
Ni	0.33	7440-02-0
Mn	0.33	7439-96-5
Li	1	7439-93-2

RN 372492-00-7 HCAPLUS

CN Aluminum cobalt lithium magnesium oxide ( $\text{Al}_{0.01}\text{Co}_{0.98}\text{LiMg}_{0.01}\text{O}_2$ )  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	0.98	7440-48-4
Mg	0.01	7439-95-4
Li	1	7439-93-2
Al	0.01	7429-90-5

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST fluorination cathode active material secondary  
nonaq electrolyte battery; cobalt  
lithium manganese nickel oxide fluoride cathode  
secondary battery

IT Secondary batteries  
(lithium; manufacture of fluorinated cathode  
active material for cathode and secondary  
nonaq. electrolyte battery)

IT Battery cathodes  
Fluorination  
(manufacture of fluorinated cathode active material for  
cathode and secondary nonaq.  
electrolyte battery)

IT 7782-41-4, Fluorine, reactions

## 10/594,489-266327-EIC 1700 SEARCH

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (fluorination by; manufacture of fluorinated cathode  
 active material for cathode and secondary  
 nonaq. electrolyte battery)

IT 160151-99-5DP, Cobalt lithium oxide (CoLi<sub>1.03</sub>O<sub>2</sub>), fluorinated  
 346417-97-8DP, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>), fluorinated 372492-00-7DP,  
 Aluminum cobalt lithium magnesium oxide (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>),  
 fluorinated

RL: IMF (Industrial manufacture); TEM (Technical or engineered  
 material use); PREP (Preparation); USES (Uses)  
 (manufacture of fluorinated cathode active material for  
 cathode and secondary nonaq.  
 electrolyte battery)

L60 ANSWER 5 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2008:156107 HCAPLUS Full-text

DOCUMENT NUMBER: 148:195375

TITLE: Nonaqueous electrolyte  
 secondary batteries and  
 method for their charging

INVENTOR(S): Kinoshita, Akira; Hasegawa, Kazuhiro;  
 Kuwahara, Tatsuyuki; Fujimoto, Hiroyuki;  
 Nakane, Ikuro

PATENT ASSIGNEE(S): SANYO Electric Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 10pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2008027833	A	20080207	JP 2006-201625	2006 0725

PRIORITY APPLN. INFO.: JP 2006-201625  
 2006  
 0725

ED Entered STN: 07 Feb 2008

AB The title batteries comprise Li cobaltate-based cathode, anodes free of metallic Li,  
 and a nonaq. electrolyte containing heterocyclic compds. having unsatd. bonding groups  
 and the charge volume capacity of the anode against cathode is 1.0-1.2, on charging to  
 cathode potential of 4.4-4.5 V (vs. Li/Li+).

IT 12190-79-3P, Cobalt lithium oxide (CoLiO<sub>2</sub>)  
 642999-33-5P, Cobalt lithium magnesium zirconium oxide  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered  
 material use); PREP (Preparation); USES (Uses)  
 (cathode active material; charging of nonaq  
 . electrolyte secondary batteries  
 having excellent charge retention)

RN 12190-79-3 HCAPLUS

CN Cobalt lithium oxide (CoLiO<sub>2</sub>) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

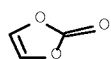
RN 642999-33-5 HCAPLUS

CN Cobalt lithium magnesium zirconium oxide (CA INDEX NAME)

## 10/594,489-266327-EIC 1700 SEARCH

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Zr	x	7440-67-7
Co	x	7440-48-4
Mg	x	7439-95-4
Li	x	7439-93-2

IT 872-36-6P, Vinylene carbonate  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (charging of nonaq. electrolyte secondary batteries having excellent charge retention)  
 RN 872-36-6 HCAPLUS  
 CN 1,3-Dioxol-2-one (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST nonaq electrolyte secondary battery lithium cobaltate cathode;  
 unsatd heterocycle electrolyte secondary battery  
 IT Secondary batteries  
 (lithium; charging of nonaq. electrolyte secondary batteries having excellent charge retention)  
 IT Battery electrolytes  
 (nonaq.; charging of nonaq. electrolyte secondary batteries having excellent charge retention)  
 IT Heterocyclic compounds  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (unsatd.; charging of nonaq. electrolyte secondary batteries having excellent charge retention)  
 IT 7782-42-5P, Graphite, uses  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (anode active material; charging of nonaq. electrolyte secondary batteries having excellent charge retention)  
 IT 12190-79-3P, Cobalt lithium oxide (CoLiO<sub>2</sub>)  
 642999-33-5P, Cobalt lithium magnesium zirconium oxide  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (cathode active material; charging of nonaq. electrolyte secondary batteries having excellent charge retention)  
 IT 872-36-6P, Vinylene carbonate  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (charging of nonaq. electrolyte secondary batteries having excellent charge retention)  
 IT 100-69-6P, 2-Vinylpyridine 30285-10-0P 30917-44-3P  
 31093-57-9P, Vinyl furan 31094-04-9P 159242-25-8P  
 1004531-49-0P  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered

## 10/594,489-266327-EIC 1700 SEARCH

material use); PREP (Preparation); USES (Uses)  
 (electrolyte; charging of nonaq.  
 electrolyte secondary batteries  
 having excellent charge retention)

L60 ANSWER 6 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2008:95501 HCAPLUS Full-text

DOCUMENT NUMBER: 148:172194

TITLE: Nonaqueous electrolyte  
 secondary batteries using  
 organolithium electrolytes and polymer  
 separators

INVENTOR(S): Obana, Yoshiaki; Saito, Midori; Murakami,  
 Takashi; Ogawa, Kenichi; Akashi, Hiroyuki

PATENT ASSIGNEE(S): Sony Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 26pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2008016414	A	20080124	JP 2006-189303	2006 0710

PRIORITY APPLN. INFO.: JP 2006-189303

2006  
0710

ED Entered STN: 24 Jan 2008

AB The batteries, e.g., secondary lithium batteries, show open-circuit voltage 4.25-4.55V in a fully charged state, and have nonaq. electrolyte compns. containing organolithium salts bearing carbonyl or sulfonyl groups bonded to B via O, preferably Li bis(oxalato)borate, Li difluorooxalatoborate. Furthermore, cathode side of separators comprise polypropylene (I), PTFE (II), and/or poly(vinylidene fluoride) (III). Preferably, the batteries are characterized by (1) the separators comprise polyolefin porous film substrate layers and cathode-side surface layers comprising I, II, and/or III, (2) the electrolyte compns. contain vinylene carbonate, or (3) cathode active mass are represented by  $\text{Li}a\text{Co}1-\text{bM}1\text{bO}2-\text{c}$  or  $\text{Li}w\text{Ni}x\text{Co}y\text{Mn}z\text{M}21-\text{x}-\text{y}-\text{zO}2-\text{v}$  ( $\text{M}1, \text{M}2 = \text{V}, \text{Cu}, \text{Zr}, \text{Zn}, \text{Mg}, \text{Al}, \text{Ga}, \text{Y}, \text{Fe}$ ;  $a = 0.9-1.1$ ;  $b = 0-0.3$ ;  $-0.1 \leq c \leq 0.1$ ;  $-0.1 \leq v \leq 0.1$ ;  $w = 0.9-1.1$ ;  $0 < x < 1$ ;  $0 < y < 1$ ;  $0 < z < 0.5$ ;  $0 < 1 - x - y - z < 1$ ). The batteries show high charge-discharge capacity and high capacity retention after storage at high temperature

IT 193215-53-1P, Cobalt lithium manganese nickel oxide

( $\text{Co}0.2\text{LiMn}0.3\text{Ni}0.5\text{O}2$ ) 372492-00-7P, Aluminum cobalt

lithium magnesium oxide ( $\text{Al}0.01\text{Co}0.98\text{LiMg}0.01\text{O}2$ )

RL: IMF (Industrial manufacture); TEM (Technical or engineered  
 material use); PREP (Preparation); USES (Uses)

(cathode active mass; nonaq.

electrolyte secondary batteries

using organolithium electrolytes and polymer separators)

RN 193215-53-1 HCAPLUS

CN Cobalt lithium manganese nickel oxide ( $\text{Co}0.2\text{LiMn}0.3\text{Ni}0.5\text{O}2$ ) (CA  
 INDEX NAME)

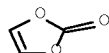
Component	Ratio	Component
=====	=====	=====
		Registry Number
O	2	17778-80-2
Co	0.2	7440-48-4
Ni	0.5	7440-02-0
Mn	0.3	7439-96-5
Li	1	7439-93-2

## 10/594,489-266327-EIC 1700 SEARCH

RN 372492-00-7 HCAPLUS  
 CN Aluminum cobalt lithium magnesium oxide (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>)  
 (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	0.98	7440-48-4
Mg	0.01	7439-95-4
Li	1	7439-93-2
Al	0.01	7429-90-5

IT 872-36-6, Vinylene carbonate  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (electrolytic solution; nonaq.  
 electrolyte secondary batteries  
 using organolithium electrolytes and polymer separators)  
 RN 872-36-6 HCAPLUS  
 CN 1,3-Dioxol-2-one (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST lithium battery lithium  
 oxalatoborate electrolyte; battery electrolyte  
 lithium fluorooxalatoborate; polypropylene separator  
 lithium battery; PTFE separator lithium  
 battery; polytetrafluoroethylene separator lithium  
 battery; polyvinylidene fluoride separator lithium  
 battery  
 IT Secondary batteries  
 (lithium; nonaq. electrolyte  
 secondary batteries using organolithium  
 electrolytes and polymer separators)  
 IT Battery cathodes  
 Battery electrolytes  
 Secondary battery separators  
 (nonaq. electrolyte secondary  
 batteries using organolithium electrolytes and polymer  
 separators)  
 IT Fluoropolymers, uses  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (nonaq. electrolyte secondary  
 batteries using organolithium electrolytes and polymer  
 separators)  
 IT Polyolefins  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (porous film substrates of separators; nonaq.  
 electrolyte secondary batteries  
 using organolithium electrolytes and polymer separators)  
 IT 193215-53-1P, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.2</sub>LiMn<sub>0.3</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 372492-00-7P, Aluminum cobalt  
 lithium magnesium oxide (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>)  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered  
 material use); PREP (Preparation); USES (Uses)  
 (cathode active mass; nonaq.  
 electrolyte secondary batteries  
 using organolithium electrolytes and polymer separators)  
 IT 872-36-6, Vinylene carbonate

## 10/594,489-266327-EIC 1700 SEARCH

RL: TEM (Technical or engineered material use); USES (Uses)  
 (electrolytic solution; nonaq.  
 electrolyte secondary batteries  
 using organolithium electrolytes and polymer separators)  
 IT 9002-84-0, Polytetrafluoroethylene 9003-07-0, Polypropylene  
 24937-79-9, Poly(vinylidene fluoride) 244761-29-3 409071-16-5  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (nonaq. electrolyte secondary  
 batteries using organolithium electrolytes and polymer  
 separators)  
 IT 9002-88-4, Polyethylene  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (porous film substrate of separator; nonaq.  
 electrolyte secondary batteries  
 using organolithium electrolytes and polymer separators)

L60 ANSWER 7 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2008:64504 HCAPLUS Full-text

DOCUMENT NUMBER: 148:148459

TITLE: Lithium mixed oxide cathode active  
 mass for nonaqueous  
 electrolyte batteries

INVENTOR(S): Morita, Koji; Kudo, Yoshihiro; Hosoya, Yosuke

PATENT ASSIGNEE(S): Sony Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 24pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2008010234	A	20080117	JP 2006-177656	2006 0628

PRIORITY APPLN. INFO.:	JP 2006-177656	2006 0628
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ED Entered STN: 17 Jan 2008

AB The cathode active mass satisfies, in x ray absorption peak at oxygen K-edge of 526-534 eV measured by XAFS when standardized in a prescribed way (definition is given), (1) ratio of integrated intensity at 4.65 V-charged state to integrated intensity at discharged state  $\geq 1.4$  or (2) deduction of absorption edge energy, determined by energy giving half value of peak top intensity on the lower energy side, at discharged state from at 4.45-4.65 V-charged state  $\leq -0.7$  eV. The cathode active mass prevents reaction with electrolyte solns. at interface and improves charge discharge cycle efficiency of nonaq. electrolyte batteries.

IT 12190-79-3, Lithium cobalt oxide (LiCoO<sub>2</sub>)  
 372492-00-7, Aluminum cobalt lithium magnesium oxide  
 (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>)

RL: PEP (Physical, engineering or chemical process); PRP  
 (Properties); TEM (Technical or engineered material use); PROC  
 (Process); USES (Uses)

(base material; lithium mixed oxide cathode active  
 mass for nonaq. electrolyte batteries)

RN 12190-79-3 HCAPLUS

CN Cobalt lithium oxide (CoLiO<sub>2</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4

## 10/594,489-266327-EIC 1700 SEARCH

Li | 1 | 7439-93-2

RN 372492-00-7 HCAPLUS

CN Aluminum cobalt lithium magnesium oxide (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.98	7440-48-4
Mg	0.01	7439-95-4
Li	1	7439-93-2
Al	0.01	7429-90-5

IT 193215-53-1P, Cobalt lithium manganese nickel oxide  
(Co<sub>0.2</sub>LiMn<sub>0.3</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 783337-14-4P, Cobalt lithium  
manganese nickel oxide (Co<sub>0.66</sub>LiMn<sub>0.17</sub>Ni<sub>0.17</sub>O<sub>2</sub>)  
1001160-49-1P, Cobalt lithium manganese nickel oxide  
(Co<sub>0.91</sub>LiMn<sub>0.05</sub>Ni<sub>0.05</sub>O<sub>2</sub>) 1001160-52-6P, Cobalt lithium  
manganese nickel oxide (Co<sub>0.91</sub>LiMn<sub>0.02</sub>Ni<sub>0.07</sub>O<sub>2</sub>)  
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical  
or engineered material use); PREP (Preparation); USES (Uses)  
(cathode active mass; lithium mixed oxide  
cathode active mass for nonaq.  
electrolyte batteries)

RN 193215-53-1 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>LiMn<sub>0.3</sub>Ni<sub>0.5</sub>O<sub>2</sub>) (CA  
INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.2	7440-48-4
Ni	0.5	7440-02-0
Mn	0.3	7439-96-5
Li	1	7439-93-2

RN 783337-14-4 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co<sub>0.66</sub>LiMn<sub>0.17</sub>Ni<sub>0.17</sub>O<sub>2</sub>)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.66	7440-48-4
Ni	0.17	7440-02-0
Mn	0.17	7439-96-5
Li	1	7439-93-2

RN 1001160-49-1 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co<sub>0.91</sub>LiMn<sub>0.05</sub>Ni<sub>0.05</sub>O<sub>2</sub>)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.91	7440-48-4
Ni	0.05	7440-02-0
Mn	0.05	7439-96-5
Li	1	7439-93-2

RN 1001160-52-6 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co<sub>0.91</sub>LiMn<sub>0.02</sub>Ni<sub>0.07</sub>O<sub>2</sub>)

## 10/594,489-266327-EIC 1700 SEARCH

(CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.91	7440-48-4
Ni	0.07	7440-02-0
Mn	0.02	7439-96-5
Li	1	7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 57

ST lithium mixed oxide cathode active mass; nonaq  
electrolyte battery cathode x ray absorption;  
cobalt lithium oxide nickel manganese cathode

IT Battery cathodes  
(lithium mixed oxide cathode active mass  
for nonaq. electrolyte batteries)

IT Secondary batteries  
(lithium; lithium mixed oxide  
cathode active mass for nonaq.  
electrolyte batteries)

IT 12190-79-3, Lithium cobalt oxide (LiCoO<sub>2</sub>) 160151-99-5,  
Cobalt lithium oxide (CoLi<sub>1.03</sub>O<sub>2</sub>) 372492-00-7, Aluminum  
cobalt lithium magnesium oxide (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>)  
915275-62-6, Aluminum cobalt lithium magnesium oxide  
(Al<sub>0.01</sub>Co<sub>0.98</sub>Li<sub>1.03</sub>Mg<sub>0.01</sub>O<sub>2</sub>)  
RL: PEP (Physical, engineering or chemical process); PRP  
(Properties); TEM (Technical or engineered material use); PROC  
(Process); USES (Uses)  
(base material; lithium mixed oxide cathode active  
mass for nonaq. electrolyte batteries)

IT 193215-53-1P, Cobalt lithium manganese nickel oxide  
(Co<sub>0.2</sub>LiMn<sub>0.3</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 783337-14-4P, Cobalt lithium  
manganese nickel oxide (Co<sub>0.66</sub>LiMn<sub>0.17</sub>Ni<sub>0.17</sub>O<sub>2</sub>)  
1001160-49-1P, Cobalt lithium manganese nickel oxide  
(Co<sub>0.91</sub>LiMn<sub>0.05</sub>Ni<sub>0.05</sub>O<sub>2</sub>) 1001160-51-5P 1001160-52-6P,  
Cobalt lithium manganese nickel oxide (Co<sub>0.91</sub>LiMn<sub>0.02</sub>Ni<sub>0.07</sub>O<sub>2</sub>)  
1001160-53-7P 1001160-54-8P 1001160-55-9P  
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical  
or engineered material use); PREP (Preparation); USES (Uses)  
(cathode active mass; lithium mixed oxide  
cathode active mass for nonaq.  
electrolyte batteries)

IT 7789-24-4, Lithium fluoride, uses 875479-77-9, Lithium manganese  
nickel oxide (Li<sub>1.08</sub>Mn<sub>0.5</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 916329-55-0, Lithium manganese  
nickel oxide (Li<sub>1.08</sub>Mn<sub>0.2</sub>Ni<sub>0.8</sub>O<sub>2</sub>)  
RL: PEP (Physical, engineering or chemical process); PRP  
(Properties); TEM (Technical or engineered material use); PROC  
(Process); USES (Uses)  
(cover material; lithium mixed oxide cathode active  
mass for nonaq. electrolyte batteries)

L60 ANSWER 8 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN  
ACCESSION NUMBER: 2007:1178522 HCAPLUS Full-text  
DOCUMENT NUMBER: 147:472119  
TITLE: Secondary nonaqueous electrolyte battery  
INVENTOR(S): Nishida, Nobumichi  
PATENT ASSIGNEE(S): SANYO Electric Co., Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 12pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

## 10/594,489-266327-EIC 1700 SEARCH

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2007273260	A	20071018	JP 2006-97602	2006 0331

PRIORITY APPLN. INFO.:

JP 2006-97602

2006  
0331

ED Entered STN: 19 Oct 2007

AB The battery has a cathode containing a cathode active mass, an anode containing an anode active mass, and a nonaq. electrolyte solution containing a nonaq. solvent and an electrolyte salt; where the charging voltage of the cathode is 4.4-5.1 V on lithium basis, the electrolyte solution further has a compound which reacts with the anode active mass and forms a coating; and the battery is prepared by repeatedly  $\geq 1$  time charging the battery until the potential of the cathode becomes 3.0-4.3 V and discharging until the potential of the cathode becomes 2.8-3.1V, and again charging until the potential of the cathode becomes  $\geq 4.4$  V.

IT 532934-38-6, Cobalt lithium manganese nickel oxide  
(Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 642999-33-5, Cobalt lithium  
magnesium zirconium oxide

RL: MOA (Modifier or additive use); USES (Uses)  
(structure and manufacture of secondary lithium batteries)

RN 532934-38-6 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.34	7440-48-4
Ni	0.33	7440-02-0
Mn	0.33	7439-96-5
Li	1	7439-93-2

RN 642999-33-5 HCAPLUS

CN Cobalt lithium magnesium zirconium oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Zr	x	7440-67-7
Co	x	7440-48-4
Mg	x	7439-95-4
Li	x	7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
623-53-0, Methyl ethyl carbonate 872-36-6, Vinylene carbonate  
7782-42-5, Graphite, uses 21324-40-3, Lithium  
hexafluorophosphate 532934-38-6, Cobalt lithium  
manganese nickel oxide (Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
642999-33-5, Cobalt lithium magnesium zirconium oxide

RL: MOA (Modifier or additive use); USES (Uses)  
(structure and manufacture of secondary lithium batteries)

L60 ANSWER 9 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2007:1060515 HCAPLUS Full-text

DOCUMENT NUMBER: 147:347219

TITLE: Secondary batteries suppressing swelling on  
high-temperature storage and nonaqueous  
electrolytes therefor

INVENTOR(S): Yamashita, Noriko; Iwanaga, Masato; Abe, Koji;

## 10/594,489-266327-EIC 1700 SEARCH

PATENT ASSIGNEE(S): Miyoshi, Kazuhiro  
 Sanyo Electric Co., Ltd., Japan; Ube  
 Industries, Ltd.  
 SOURCE: Jpn. Kokai Tokkyo Koho, 10pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2007242464	A	20070920	JP 2006-64400	2006 0309

PRIORITY APPLN. INFO.: JP 2006-64400  
 2006  
 0309

OTHER SOURCE(S): MARPAT 147:347219

ED Entered STN: 21 Sep 2007

AB The title batteries satisfy cathode potential (Li standard) 4.4-5.1 V and have nonaq.  
 electrolytes (also claimed) containing R1OCOC.tplbond.CO2R2 (R1, R2 = alkyl). The  
 batteries may have cathode active masses containing Zr- and Mg-added Li cobaltates and  
 Li Ni Mn complex oxides with layered structure. The batteries exhibit improved  
 overcharge safety.

IT 182442-95-1P, Cobalt lithium manganese nickel oxide  
 642999-33-5P, Cobalt lithium magnesium zirconium oxide  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered  
 material use); PREP (Preparation); USES (Uses)  
 (cathode active mass; nonaq. electrolyte secondary batteries  
 containing dialkyl acetylenedicarboxylates to suppress high-temperature  
 swelling)

RN 182442-95-1 HCAPLUS

CN Cobalt lithium manganese nickel oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Co	x	7440-48-4
Ni	x	7440-02-0
Mn	x	7439-96-5
Li	x	7439-93-2

RN 642999-33-5 HCAPLUS

CN Cobalt lithium magnesium zirconium oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Zr	x	7440-67-7
Co	x	7440-48-4
Mg	x	7439-95-4
Li	x	7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 182442-95-1P, Cobalt lithium manganese nickel oxide  
 642999-33-5P, Cobalt lithium magnesium zirconium oxide  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered  
 material use); PREP (Preparation); USES (Uses)  
 (cathode active mass; nonaq. electrolyte secondary batteries  
 containing dialkyl acetylenedicarboxylates to suppress high-temperature  
 swelling)

## 10/594,489-266327-EIC 1700 SEARCH

L60 ANSWER 10 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2007:819603 HCAPLUS Full-text  
 DOCUMENT NUMBER: 147:215670  
 TITLE: Nonaqueous electrolyte secondary battery,  
 nonaqueous electrolyte, and charging method  
 therefor  
 INVENTOR(S): Iwanaga, Masato; Oki, Yukihiro; Abe, Koji;  
 Miyoshi, Kazuhiro  
 PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan; Ube  
 Industries Ltd.  
 SOURCE: U.S. Pat. Appl. Publ., 10pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO. -----	KIND ----	DATE -----	APPLICATION NO. -----	DATE
US 20070172730	A1	20070726	US 2007-656486	2007 0123
JP 2007200688	A	20070809	JP 2006-17286	2006 0126
CN 101009391	A	20070801	CN 2007-10001454	2007 0108
KR 2007078371	A	20070731	KR 2007-3840	2007 0112
PRIORITY APPLN. INFO.:			JP 2006-17286	A 2006 0126

ED Entered STN: 27 Jul 2007

AB A nonaq. electrolyte secondary battery of the invention has a pos. electrode having a pos. electrode active material, a neg. electrode, and a nonaq. electrolyte having electrolyte salt in a nonaq. solvent. The elec. potential of the pos. electrode active material is 4.4 to 4.6 V relative to lithium, and the nonaq. electrolyte contains pentafluorophenol methanesulfonate. The quantity of compound added is preferably 0.1% to 2% by mass. Also, the pos. electrode active material preferably comprises a mixture of a lithium-cobalt composite oxide which is LiCoO<sub>2</sub> containing at least both zirconium and magnesium and a lithium-manganese-nickel composite oxide that has a layer structure and contains at least both manganese and nickel. Thanks to such structure, a nonaq. electrolyte secondary battery can be provided that is charged to charging termination potential of 4.4 to 4.6 V relative to lithium and that has enhanced overcharging safety.

IT 532934-38-6P, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)

RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (nonaq. electrolyte secondary battery, nonaq. electrolyte, and charging method therefor)

RN 532934-38-6 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
 (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.34	7440-48-4
Ni	0.33	7440-02-0
Mn	0.33	7439-96-5
Li	1	7439-93-2

## 10/594,489-266327-EIC 1700 SEARCH

IT 642999-33-5, Cobalt lithium magnesium zirconium oxide  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (nonaq. electrolyte secondary battery, nonaq. electrolyte, and  
 charging method therefor)  
 RN 642999-33-5 HCAPLUS  
 CN Cobalt lithium magnesium zirconium oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Zr	x	7440-67-7
Co	x	7440-48-4
Mg	x	7439-95-4
Li	x	7439-93-2

INCL -429; -429; 429231300; -429; -429; -429; -429; -320  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 IT 532934-38-6P, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
 RL: SPN (Synthetic preparation); TEM (Technical or engineered  
 material use); PREP (Preparation); USES (Uses)  
 (nonaq. electrolyte secondary battery, nonaq. electrolyte, and  
 charging method therefor)  
 IT 96-49-1, Ethylene carbonate 105-58-8, DiEthyl carbonate  
 623-53-0, Ethyl methyl carbonate 21324-40-3, Lithium  
 hexafluorophosphate 162684-16-4, Lithium manganese nickel oxide  
 642999-33-5, Cobalt lithium magnesium zirconium oxide  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (nonaq. electrolyte secondary battery, nonaq. electrolyte, and  
 charging method therefor)

L60 ANSWER 11 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2007:671079 HCAPLUS Full-text  
 DOCUMENT NUMBER: 147:75912  
 TITLE: Secondary nonaqueous  
 electrolyte battery  
 INVENTOR(S): Obana, Yoshiaki; Akashi, Hiroyuki  
 PATENT ASSIGNEE(S): Sony Corp., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 22pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

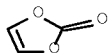
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2007157458	A	20070621	JP 2005-350010	2005 1202

PRIORITY APPLN. INFO.: JP 2005-350010  
 2005  
 1202

ED Entered STN: 21 Jun 2007  
 AB The battery has an electrode group containing a separator between a cathode and an  
 anode and a nonaq. electrolyte solution, and possesses an open circuit voltage 4.30-  
 4.55 V in a full-charged state per electrode pair; where the electrolyte solution  
 contains vinylene carbonate, and the amount of the electrolyte solution is 80-95% of  
 the saturated electrolyte solution saturatedly adsorbed to the electrode group.  
 IT 872-36-6, Vinylene carbonate  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (structure of secondary lithium  
 batteries having vinylene carbonate contained

## 10/594,489-266327-EIC 1700 SEARCH

electrolyte solns.)  
 RN 872-36-6 HCAPLUS  
 CN 1,3-Dioxol-2-one (CA INDEX NAME)



IT 193215-53-1, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.2</sub>LiMn<sub>0.3</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 372492-00-7, Aluminum cobalt  
 lithium magnesium oxide (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>)  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (structure of secondary lithium  
 batteries having vinylene carbonate contained  
 electrolyte solns.)  
 RN 193215-53-1 HCAPLUS  
 CN Cobalt lithium manganese nickel oxide (Co<sub>0.2</sub>LiMn<sub>0.3</sub>Ni<sub>0.5</sub>O<sub>2</sub>) (CA  
 INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	0.2	7440-48-4
Ni	0.5	7440-02-0
Mn	0.3	7439-96-5
Li	1	7439-93-2

RN 372492-00-7 HCAPLUS  
 CN Aluminum cobalt lithium magnesium oxide (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>)  
 (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	0.98	7440-48-4
Mg	0.01	7439-95-4
Li	1	7439-93-2
Al	0.01	7429-90-5

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST secondary battery electrolyte vinylene  
 carbonate  
 IT Secondary batteries  
 (structure of secondary lithium  
 batteries having porous F-containing polymers between  
 cathodes and separators)  
 IT 872-36-6, Vinylene carbonate  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (structure of secondary lithium  
 batteries having vinylene carbonate contained  
 electrolyte solns.)  
 IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate  
 623-53-0, Methyl ethyl carbonate 7782-42-5, Graphite, uses  
 9002-88-4, Polyethylene 9003-07-0, Polypropylene 21324-40-3,  
 Lithium hexafluorophosphate 193215-53-1, Cobalt lithium  
 manganese nickel oxide (Co<sub>0.2</sub>LiMn<sub>0.3</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 372492-00-7  
 , Aluminum cobalt lithium magnesium oxide (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>)  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (structure of secondary lithium  
 batteries having vinylene carbonate contained  
 electrolyte solns.)

## 10/594,489-266327-EIC 1700 SEARCH

L60 ANSWER 12 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2007:435178 HCAPLUS Full-text  
 DOCUMENT NUMBER: 146:444865  
 TITLE: Secondary battery  
 INVENTOR(S): Morita, Koji; Li, Guohua; Morita, Nozomu;  
 Murakami, Takashi; Azuma, Hideto  
 PATENT ASSIGNEE(S): Sony Corp., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 22pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
JP 2007103306	A	20070419	JP 2005-295358	2005 1007
PRIORITY APPLN. INFO.:			JP 2005-295358	2005 1007

ED Entered STN: 20 Apr 2007

AB The battery comprises a cathode having a cathode active mass layer which contains a Li-Co composite oxide, an anode, and an electrolyte solution, and has an open circuit voltage  $\geq 4.25$  V in the completely charged state per electrode pair; where after charging a test battery which is prepared by placing 2 test separators sandwiching the cathode as a test cathode and a test anode facing the cathode, the amount of the metal component deposits (excluding Li), which is deposited on the test anode or on the test separator of the anode side electrode at a ratio per unit mass of the metal component (excluding Li) which is contained in the cathode active material layer opposed to the test cathode of the test anode electrode, is  $\leq 2000$  mass ppm.

IT 787635-98-7, Cobalt lithium manganese nickel oxide  
 (Co0.2Li1.08Mn0.3Ni0.5O2)

RL: MOA (Modifier or additive use); USES (Uses)  
 (cathodes containing Li-Co composite oxides for  
 secondary batteries)

RN 787635-98-7 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co0.2Li1.08Mn0.3Ni0.5O2)  
 (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	0.2	7440-48-4
Ni	0.5	7440-02-0
Mn	0.3	7439-96-5
Li	1.08	7439-93-2

IT 12190-79-3, Cobalt lithium oxide (CoLiO2)  
 346417-97-8, Cobalt lithium manganese nickel oxide  
 (Co0.33LiMn0.33Ni0.33O2) 372492-00-7, Aluminum cobalt  
 lithium magnesium oxide (Al0.01Co0.98LiMg0.01O2)  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (cathodes containing Li-Co composite oxides for  
 secondary batteries)

RN 12190-79-3 HCAPLUS

CN Cobalt lithium oxide (CoLiO2) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====

## 10/594,489-266327-EIC 1700 SEARCH

O		2		17778-80-2
Co		1		7440-48-4
Li		1		7439-93-2

RN 346417-97-8 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
(CA INDEX NAME)

Component		Ratio		Component Registry Number
O		2		17778-80-2
Co		0.33		7440-48-4
Ni		0.33		7440-02-0
Mn		0.33		7439-96-5
Li		1		7439-93-2

RN 372492-00-7 HCAPLUS

CN Aluminum cobalt lithium magnesium oxide (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>)  
(CA INDEX NAME)

Component		Ratio		Component Registry Number
O		2		17778-80-2
Co		0.98		7440-48-4
Mg		0.01		7439-95-4
Li		1		7439-93-2
Al		0.01		7429-90-5

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST battery secondary cathode

lithium cobalt composite oxide

IT Battery cathodes

Secondary batteries

(cathodes containing Li-Co composite oxides for  
secondary batteries)

IT 787635-98-7, Cobalt lithium manganese nickel oxide

(Co<sub>0.2</sub>Li<sub>1.08</sub>Mn<sub>0.3</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 875479-77-9, Lithium manganese nickel  
oxide (Li<sub>1.08</sub>Mn<sub>0.5</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 916329-55-0, Lithium manganese nickel  
oxide (Li<sub>1.08</sub>Mn<sub>0.2</sub>Ni<sub>0.8</sub>O<sub>2</sub>)

RL: MOA (Modifier or additive use); USES (Uses)

(cathodes containing Li-Co composite oxides for  
secondary batteries)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate

7782-42-5, Graphite, uses 12190-79-3, Cobalt lithium

oxide (CoLiO<sub>2</sub>) 21324-40-3, Lithium hexafluorophosphate

346417-97-8, Cobalt lithium manganese nickel oxide

(Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 372492-00-7, Aluminum cobalt  
lithium magnesium oxide (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>) 916329-48-1,

Aluminum cobalt lithium magnesium oxide

(Al<sub>0.01</sub>Co<sub>0.98</sub>Li<sub>1.03</sub>Mg<sub>0.01</sub>O<sub>2</sub>.O<sub>2</sub>) 916329-50-5, Cobalt lithiumzirconium oxide (Co<sub>0.98</sub>Li<sub>1.03</sub>Zr<sub>0.02</sub>O<sub>2</sub>.O<sub>2</sub>)

RL: TEM (Technical or engineered material use); USES (Uses)

(cathodes containing Li-Co composite oxides for  
secondary batteries)

L60 ANSWER 13 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2007:175008 HCAPLUS Full-text

DOCUMENT NUMBER: 146:232777

TITLE: Cathode material for lithium

secondary batteries with

non-aqueous

electrolyte

INVENTOR(S): Kitao, Hideki; Kida, Yoshinori; Shimizu,

Noriyuki

PATENT ASSIGNEE(S): Japan

## 10/594,489-266327-EIC 1700 SEARCH

SOURCE: U.S. Pat. Appl. Publ., 8pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20070037056	A1	20070215	US 2006-501224	2006 0809
JP 2007073487	A	20070322	JP 2005-278108	2005 0926
KR 2007019581	A	20070215	KR 2006-75719	2006 0810
CN 1913211	A	20070214	CN 2006-10109780	2006 0811
PRIORITY APPLN. INFO.:			JP 2005-233528	A 2005 0811
			JP 2005-278108	A 2005 0926

ED Entered STN: 16 Feb 2007

AB This secondary battery contains a cathode-active material which consists of a mixture of a Li-containing transition metal oxide with Ni and Mn as transition metals and having a crystal structure belonging to the space group R3m. The cathode material also contains a 2nd Li-containing transition metal oxide with Ni, Co, and Mn as transition metals and having a crystal structure belonging to the space group R3m, or a mixture of the 1st Li-containing transition metal oxide and a Li Co oxide. The 1st Li-containing transition metal oxide is  $\text{Li}_a\text{Ni}_x\text{Mn}_y\text{O}_2$  with  $1 \leq a \leq 1.5$ ,  $0.5 \leq x+y \leq 1$ ,  $0 < x < 1$ , and  $0 < y < 1$ . The 2nd Li-containing transition metal oxide is  $\text{Li}_b\text{Ni}_p\text{Mn}_q\text{Co}_r\text{O}_2$  with  $1 \leq b \leq 1.5$ ,  $0.5 \leq p+q+r \leq 1$ ,  $0 < p < 1$ ,  $0 < q < 1$ , and  $0 < r < 1$ .

IT 924888-60-8P, Cobalt lithium manganese nickel oxide  
 (Co0.3Li1.15Mn0.3Ni0.4O2)

RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (cathode material for lithium secondary batteries with non-aqueous electrolyte)

RN 924888-60-8 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co0.3Li1.15Mn0.3Ni0.4O2)  
 (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.3	7440-48-4
Ni	0.4	7440-02-0
Mn	0.3	7439-96-5
Li	1.15	7439-93-2

IT 182442-95-1, Cobalt lithium manganese nickel oxide  
 477700-15-5, Cobalt lithium oxide (Co0.99LiO2)

RL: TEM (Technical or engineered material use); USES (Uses)  
 (cathode material for lithium secondary batteries with non-aqueous electrolyte)

## 10/594,489-266327-EIC 1700 SEARCH

RN 182442-95-1 HCAPLUS

CN Cobalt lithium manganese nickel oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Co	x	7440-48-4
Ni	x	7440-02-0
Mn	x	7439-96-5
Li	x	7439-93-2

RN 477700-15-5 HCAPLUS

CN Cobalt lithium oxide (Co0.99LiO2) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.99	7440-48-4
Li	1	7439-93-2

INCL 429231100; 429223000; 429224000; 429231300

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium battery cathode

IT Battery cathodes

(cathode material for lithium  
secondary batteries with non-  
aqueous electrolyte)

IT Secondary batteries

(lithium; cathode material for  
lithium secondary batteries with  
non-aqueous electrolyte)

IT 144973-40-OP, Lithium manganese nickel oxide (Li1.1Mn0.5Ni0.5O2)

924888-60-8E, Cobalt lithium manganese nickel oxide

(Co0.3Li1.15Mn0.3Ni0.4O2)

RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical  
or engineered material use); PREP (Preparation); USES (Uses)

(cathode material for lithium  
secondary batteries with non-  
aqueous electrolyte)

IT 924888-62-OP, Lithium manganese nickel oxide (Li1.3Mn0.6Ni0.1O2)

RL: SPN (Synthetic preparation); TEM (Technical or engineered  
material use); PREP (Preparation); USES (Uses)

(cathode material for lithium  
secondary batteries with non-  
aqueous electrolyte)

IT 162684-16-4, Lithium manganese nickel oxide 182442-95-1,

Cobalt lithium manganese nickel oxide 477700-15-5,

Cobalt lithium oxide (Co0.99LiO2)

RL: TEM (Technical or engineered material use); USES (Uses)

(cathode material for lithium  
secondary batteries with non-  
aqueous electrolyte)

L60 ANSWER 14 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2007:170143 HCAPLUS Full-text

DOCUMENT NUMBER: 146:232710

TITLE: Secondary lithium  
batteries using two kinds of  
cathode active mass

INVENTOR(S): Obana, Yoshiaki; Ogawa, Kenichi; Hara,  
Tomitato; Kajita, Atsushi; Akashi, Hiroyuki

PATENT ASSIGNEE(S): Sony Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 21pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

## 10/594,489-266327-EIC 1700 SEARCH

LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2007042302	A	20070215	JP 2005-222037	2005 0729

PRIORITY APPLN. INFO.: JP 2005-222037  
 2005  
 0729

ED Entered STN: 15 Feb 2007

AB In the batteries, cathodes active mas contain LiaCol-bMlbO2-c (Ml = Mn, Ni, Mg, Al, B, Ti, V, Cr, Fe, Cu, Zn, Ga, Y, Zr, Nb, Mo, Sn, Ca, Sr, W; a = 0.9-1.1; b = 0-0.3, -0.1 ≤ c ≤ 0.1) and LiwNixCoyMnzM2l-x-y-zO2-v [M2 = Mg, Al, B, Ti, V, Cr, Fe, Cu, Zn, Ga, Y, Zr, Nb, Mo, Sn, Ca, Sr, W; -0.1 ≤ v ≤ 0.1; w = 0.9-1.1; 0 < x < 1; 0 < y < 0.7; 0 < z < 0.5; 0 ≤ (1 - x - y - z) ≤ 0.2]. The batteries have open circuit voltage 4.25-6.00 V per one pair of cathode and anode in a completely charged state. Preferably, the batteries have anodes containing carbonaceous active mass, and at least part of separators on the cathode side comprise poly(vinylidene fluoride) and/or polypropylene. The batteries show high energy d. and charge-discharge efficiency.

IT 193215-53-1P, Cobalt lithium manganese nickel oxide (Co0.2LiMn0.3Ni0.5O2) 346417-97-8P, Cobalt lithium manganese nickel oxide (Co0.33LiMn0.33Ni0.33O2) 372492-00-7P, Aluminum cobalt lithium magnesium oxide (Al0.01Co0.98LiMg0.01O2)  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (secondary lithium batteries using two kinds of cathode active mass with high energy d. and charge-discharge efficiency)

RN 193215-53-1 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co0.2LiMn0.3Ni0.5O2) (CA INDEX NAME)

Component	Ratio	Component	Registry Number
O	2		17778-80-2
Co	0.2		7440-48-4
Ni	0.5		7440-02-0
Mn	0.3		7439-96-5
Li	1		7439-93-2

RN 346417-97-8 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co0.33LiMn0.33Ni0.33O2) (CA INDEX NAME)

Component	Ratio	Component	Registry Number
O	2		17778-80-2
Co	0.33		7440-48-4
Ni	0.33		7440-02-0
Mn	0.33		7439-96-5
Li	1		7439-93-2

RN 372492-00-7 HCAPLUS

CN Aluminum cobalt lithium magnesium oxide (Al0.01Co0.98LiMg0.01O2) (CA INDEX NAME)

Component	Ratio	Component	Registry Number

## 10/594,489-266327-EIC 1700 SEARCH

=====+=====		
O		2
Co		0.98
Mg		0.01
Li		1
Al		0.01

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST lithium cobalt oxide blend battery cathode;  
 battery cathode lithium nickel cobalt  
 manganese oxide; cobalt lithium manganese nickel oxide battery  
 cathode

IT Carbon fibers, uses  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (anode active mass; secondary lithium  
 batteries using two kinds of cathode active  
 mass with high energy d. and charge-discharge efficiency)

IT Secondary batteries  
 (lithium; secondary lithium  
 batteries using two kinds of cathode active  
 mass with high energy d. and charge-discharge efficiency)

IT Battery anodes  
 Battery cathodes  
 Secondary battery separators  
 (secondary lithium batteries  
 using two kinds of cathode active mass with high  
 energy d. and charge-discharge efficiency)

IT Fluoropolymers, uses  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (secondary lithium batteries  
 using two kinds of cathode active mass with high  
 energy d. and charge-discharge efficiency)

IT 7782-42-5, Graphite, uses  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (anode active mass; secondary lithium  
 batteries using two kinds of cathode active  
 mass with high energy d. and charge-discharge efficiency)

IT 193215-53-1P, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.2</sub>LiMn<sub>0.3</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 346417-97-8P, Cobalt lithium  
 manganese nickel oxide (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
 372492-00-7P, Aluminum cobalt lithium magnesium oxide  
 (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>)  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered  
 material use); PREP (Preparation); USES (Uses)  
 (secondary lithium batteries  
 using two kinds of cathode active mass with high  
 energy d. and charge-discharge efficiency)

IT 9003-07-0, Polypropylene 24937-79-9, Poly(vinylidene fluoride)  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (separator; secondary lithium  
 batteries using two kinds of cathode active  
 mass with high energy d. and charge-discharge efficiency)

L60 ANSWER 15 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2007:117698 HCAPLUS Full-text

DOCUMENT NUMBER: 146:209722

TITLE: Battery

INVENTOR(S): Obana, Yoshiaki; Tokunaga, Takashi; Akashi,  
 Hiroyuki

PATENT ASSIGNEE(S): Sony Corporation, Japan

SOURCE: U.S. Pat. Appl. Publ., 21pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

## 10/594,489-266327-EIC 1700 SEARCH

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20070026311	A1	20070201	US 2006-459514	2006 0724
JP 2007059379	A	20070308	JP 2006-141036	2006 0522
KR 2007015059	A	20070201	KR 2006-71264	2006 0728
CN 1917276	A	20070221	CN 2006-10136308	2006 0731
PRIORITY APPLN. INFO.:			JP 2005-222195	A 2005 0729
			JP 2006-141036	A 2006 0522

ED Entered STN: 02 Feb 2007

AB A battery capable of improving the charge and discharge efficiency even when the battery voltage is set to over 4.2 V is provided. A cathode and an anode are oppositely arranged with an electrolyte and a separator in between. The open circuit voltage in full charge is in the range from 4.25 V to 6.00 V. The cathode has a cathode current collector and a cathode active material layer provided on the cathode current collector. The cathode active material layer contains, as a binder, a polymer with intrinsic viscosity of 2.0 dL/g to 10 dL/g which contains vinylidene fluoride as an element.

IT 193215-53-1P, Cobalt lithium manganese nickel oxide (Co0.2LiMn0.3Ni0.5O2) 372492-00-7P, Aluminum cobalt lithium magnesium oxide (Al0.01Co0.98LiMg0.01O2)  
 RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (battery with cathode containing binder)

RN 193215-53-1 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co0.2LiMn0.3Ni0.5O2) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.2	7440-48-4
Ni	0.5	7440-02-0
Mn	0.3	7439-96-5
Li	1	7439-93-2

RN 372492-00-7 HCAPLUS

CN Aluminum cobalt lithium magnesium oxide (Al0.01Co0.98LiMg0.01O2)  
 (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.98	7440-48-4
Mg	0.01	7439-95-4
Li	1	7439-93-2
Al	0.01	7429-90-5

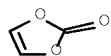
IT 372-36-6, Vinylene carbonate 346417-97-8, Cobalt lithium manganese nickel oxide (Co0.33LiMn0.33Ni0.33O2)  
 868842-82-4

## 10/594,489-266327-EIC 1700 SEARCH

RL: TEM (Technical or engineered material use); USES (Uses)  
(battery with cathode containing binder)

RN 872-36-6 HCAPLUS

CN 1,3-Dioxol-2-one (CA INDEX NAME)



RN 346417-97-8 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.33	7440-48-4
Ni	0.33	7440-02-0
Mn	0.33	7439-96-5
Li	1	7439-93-2

RN 868842-82-4 HCAPLUS

CN Aluminum cobalt lithium magnesium zirconium oxide  
(Al<sub>0.01</sub>Co<sub>0.97</sub>LiMg<sub>0.01</sub>Zr<sub>0.01</sub>O<sub>2</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Zr	0.01	7440-67-7
Co	0.97	7440-48-4
Mg	0.01	7439-95-4
Li	1	7439-93-2
Al	0.01	7429-90-5

INCL 429217000; 429231300; 429223000; 429221000; 429231500; 429220000;  
429229000; 429231600; 429338000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST battery cathode

IT Battery cathodes

(battery with cathode containing binder)

IT Carbonaceous materials (technological products)

Fluoropolymers, uses

RL: TEM (Technical or engineered material use); USES (Uses)

(battery with cathode containing binder)

IT Secondary batteries

(lithium; battery with cathode  
containing binder)

IT 193215-53-1P, Cobalt lithium manganese nickel oxide

(Co<sub>0.2</sub>LiMn<sub>0.3</sub>Ni<sub>0.5</sub>O<sub>2</sub>) 372492-00-7P, Aluminum cobalt

lithium magnesium oxide (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>)

RL: SPN (Synthetic preparation); TEM (Technical or engineered  
material use); PREP (Preparation); USES (Uses)

(battery with cathode containing binder)

IT 872-36-6, Vinylene carbonate 9002-88-4, Polyethylene

9003-07-0, Polypropylene 24937-79-9, Polyvinylidene fluoride

37323-13-0, Chromium cobalt lithium oxide 104245-03-6,

Cobalt lithium zinc oxide 116713-67-8, Cobalt

lithium titanium oxide 120479-28-9, Cobalt copper

lithium oxide 131344-56-4, Cobalt lithium

nickel oxide 146956-50-5, Cobalt lithium vanadium

oxide 147683-99-6, Cobalt lithium zirconium oxide

## 10/594,489-266327-EIC 1700 SEARCH

149087-95-6, Cobalt lithium tin oxide 152654-50-7,  
 Cobalt iron lithium oxide 154838-53-6, Aluminum cobalt  
 lithium oxide 186298-15-7 186298-17-9 186298-22-6  
 187144-47-4, Calcium cobalt lithium oxide 187144-48-5,  
 Cobalt lithium magnesium oxide 214536-41-1, Cobalt  
 lithium manganese oxide 253875-52-4, Cobalt  
 lithium niobium oxide 253875-55-7, Cobalt  
 lithium strontium oxide 326895-11-8, Cobalt  
 lithium yttrium oxide 346417-97-8, Cobalt  
 lithium manganese nickel oxide (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
 350580-22-2, Cobalt lithium tungsten oxide  
 382151-87-3, Boron cobalt lithium oxide 478037-17-1  
 483965-60-2, Cobalt gallium lithium oxide 656812-56-5,  
 Cobalt lithium molybdenum oxide 824957-50-8  
 824957-51-9 855998-69-5 855998-70-8 855998-71-9  
 855998-72-0 863498-38-8 864452-44-8 868842-82-4  
 897031-15-1 897031-16-2 897031-18-4 922733-62-8  
 922733-63-9 922733-64-0

RL: TEM (Technical or engineered material use); USES (Uses)  
 (battery with cathode containing binder)

L60 ANSWER 16 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2006:1094429 HCAPLUS Full-text

DOCUMENT NUMBER: 145:401049

TITLE: Secondary batteries containing lithium  
 tetrafluoroborate in nonaqueous electrolytes,  
 and method for charging the batteries

INVENTOR(S): Tsutsumi, Shuji; Iwanaga, Masato; Oga,  
 Keisuke; Nishida, Nobumichi

PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 14pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2006286382	A	20061019	JP 2005-104283	

2005  
0331

PRIORITY APPLN. INFO.: JP 2005-104283

2005  
0331

ED Entered STN: 20 Oct 2006

AB The batteries have cathode active mass with potential (based on Li) 4.4-4.6 V  
 containing Zr- and Mg-containing LiCoO<sub>2</sub> and layered Li Mn Ni mixed oxides, and 0.05-  
 1.5% (based on weight of nonaq. electrolytes) LiBF<sub>4</sub> in nonaq. electrolytes. The  
 batteries show improved cycle efficiency and reduced swelling.

IT 532934-38-6P, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 642999-33-5P, Cobalt lithium  
 magnesium zirconium oxide  
 RL: DEV (Device component use); IMF (Industrial manufacture); PREP  
 (Preparation); USES (Uses)  
 (cathode active mass; secondary batteries containing lithium  
 tetrafluoroborate in nonaq. electrolytes)

RN 532934-38-6 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
 (CA INDEX NAME)

Component	Ratio	Component
=====	=====	=====
O	2	17778-80-2

## 10/594,489-266327-EIC 1700 SEARCH

Co		0.34		7440-48-4
Ni		0.33		7440-02-0
Mn		0.33		7439-96-5
Li		1		7439-93-2

RN 642999-33-5 HCAPLUS

CN Cobalt lithium magnesium zirconium oxide (CA INDEX NAME)

Component		Ratio		Component Registry Number
=====	+	=====	+	=====
O		x		17778-80-2
Zr		x		7440-67-7
Co		x		7440-48-4
Mg		x		7439-95-4
Li		x		7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 532934-38-6P, Cobalt lithium manganese nickel oxide  
(Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 642999-33-5P, Cobalt lithium  
magnesium zirconium oxideRL: DEV (Device component use); IMF (Industrial manufacture); PREP  
(Preparation); USES (Uses)(cathode active mass; secondary batteries containing lithium  
tetrafluoroborate in nonaq. electrolytes)

L60 ANSWER 17 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2006:1094404 HCAPLUS Full-text

DOCUMENT NUMBER: 145:401047

TITLE: Secondary nonaqueous electrolyte batteries  
bonded with pressure-sensitive adhesive tapes,  
and method for charging the batteries

INVENTOR(S): Obayashi, Atsushi

PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 11pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2006286337	A	20061019	JP 2005-103173	

2005

0331

PRIORITY APPLN. INFO.: JP 2005-103173

2005

0331

ED Entered STN: 20 Oct 2006

AB The batteries have cathode active mass with potential (based on Li) 4.4-4.6 V  
containing (A) Zr- and Mg-containing Li Co mixed oxides and (B) layered Li Ni Mn mixed  
oxides, and pressure-sensitive adhesive tapes composed of substrate layers and rubber  
adhesive layers for protection, insulation, or prevention of unwinding of electrodes.  
The batteries have cathode active mass with improved thermal stability at high  
potential, and show improved safety and cycle efficiency.

IT 182442-95-1P, Cobalt lithium manganese nickel oxide

642999-33-5P, Cobalt lithium magnesium zirconium oxide

RL: DEV (Device component use); IMF (Industrial manufacture); PREP  
(Preparation); USES (Uses)(cathode active mass; secondary nonaq. electrolyte batteries  
bonded with pressure-sensitive adhesive tapes)

RN 182442-95-1 HCAPLUS

CN Cobalt lithium manganese nickel oxide (CA INDEX NAME)

## 10/594,489-266327-EIC 1700 SEARCH

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Co	x	7440-48-4
Ni	x	7440-02-0
Mn	x	7439-96-5
Li	x	7439-93-2

RN 642999-33-5 HCAPLUS

CN Cobalt lithium magnesium zirconium oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Zr	x	7440-67-7
Co	x	7440-48-4
Mg	x	7439-95-4
Li	x	7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 182442-95-1P, Cobalt lithium manganese nickel oxide

642999-33-5P, Cobalt lithium magnesium zirconium oxide

RL: DEV (Device component use); IMF (Industrial manufacture); PREP  
(Preparation); USES (Uses)(cathode active mass; secondary nonaq. electrolyte batteries  
bonded with pressure-sensitive adhesive tapes)

L60 ANSWER 18 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2006:1094402 HCAPLUS Full-text

DOCUMENT NUMBER: 145:401046

TITLE: Secondary nonaqueous electrolyte batteries  
having cathode active mass with controlled  
size and shape, and method for charging the  
batteries

INVENTOR(S): Inoue, Hidetoshi; Nishida, Nobumichi

PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 12pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2006286336	A	20061019	JP 2005-103172	2005 0331

PRIORITY APPLN. INFO.: JP 2005-103172

2005  
0331

ED Entered STN: 20 Oct 2006

AB The batteries have cathode active mass with potential (based on Li) 4.4-4.6 V  
containing (A) Zr- and Mg-containing Li Co mixed oxides with average particle size (X)  
7-30  $\mu$ m, and (B) layered Li Ni Mn mixed oxides having average particle size (Y) 2-15  $\mu$ m  
and aggregated spherical or elliptical shapes with ratio of minor axis/major axis 0.80-  
1.0, satisfying X/Y = 1.4-15. The batteries have cathode active mass with improved  
thermal stability at high potential, and show improved safety and cycle efficiency.

IT 182442-95-1P, Cobalt lithium manganese nickel oxide

642999-33-5P, Cobalt lithium magnesium zirconium oxide

RL: DEV (Device component use); IMF (Industrial manufacture); PREP  
(Preparation); USES (Uses)

## 10/594,489-266327-EIC 1700 SEARCH

(cathode active mass; secondary nonaq. electrolyte batteries  
having cathode active mass with controlled size and shape)

RN 182442-95-1 HCAPLUS

CN Cobalt lithium manganese nickel oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Co	x	7440-48-4
Ni	x	7440-02-0
Mn	x	7439-96-5
Li	x	7439-93-2

RN 642999-33-5 HCAPLUS

CN Cobalt lithium magnesium zirconium oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Zr	x	7440-67-7
Co	x	7440-48-4
Mg	x	7439-95-4
Li	x	7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 182442-95-1P, Cobalt lithium manganese nickel oxide

642999-33-5P, Cobalt lithium magnesium zirconium oxide

RL: DEV (Device component use); IMF (Industrial manufacture); PREP  
(Preparation); USES (Uses)

(cathode active mass; secondary nonaq. electrolyte batteries  
having cathode active mass with controlled size and shape)

L60 ANSWER 19 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2006:1038921 HCAPLUS Full-text

DOCUMENT NUMBER: 145:380403

TITLE: Battery

INVENTOR(S): Hara, Tomitaro; Akashi, Hiroyuki; Ogawa,  
Kenichi; Obana, Yoshiaki; Hosoya, Yosuke

PATENT ASSIGNEE(S): Japan

SOURCE: U.S. Pat. Appl. Publ., 15pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20060222957	A1	20061005	US 2006-278576	2006 0404
JP 2006313719	A	20061116	JP 2005-222038	2005 0729
KR 2006106887	A	20061012	KR 2006-30077	2006 0403
CN 1848512	A	20061018	CN 2006-10074018	2006 0404

PRIORITY APPLN. INFO.: JP 2005-107784 A  
2005  
0404

## 10/594,489-266327-EIC 1700 SEARCH

JP 2005-222038

A

2005

0729

ED Entered STN: 06 Oct 2006

AB A battery capable of improving the energy d. and improving the cycle characteristics is provided. The battery includes a spirally wound electrode body, in which a cathode and an anode are wound with a separator and an electrolyte in between. The open circuit voltage in full charge is in the range from 4.25 V to 6.00 V. The electrolyte contains an electrolytic solution and a polymer containing vinylidene fluoride as a component. The polymer containing vinylidene fluoride as a component has high oxidation stability. Therefore, even when the battery voltage is raised, oxidation and decomposition of the electrolyte and the separator can be inhibited.

IT 12190-79-3, Cobalt lithium oxide (CoLiO2)

RL: DEV (Device component use); USES (Uses)  
(battery)

RN 12190-79-3 HCAPLUS

CN Cobalt lithium oxide (CoLiO2) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 346417-97-8P, Cobalt lithium manganese nickel oxide  
(Co0.33LiMn0.33Ni0.33O2) 372492-00-7P, Aluminum cobalt  
lithium magnesium oxide (Al0.01Co0.98LiMg0.01O2)

RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(battery)

RN 346417-97-8 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co0.33LiMn0.33Ni0.33O2)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.33	7440-48-4
Ni	0.33	7440-02-0
Mn	0.33	7439-96-5
Li	1	7439-93-2

RN 372492-00-7 HCAPLUS

CN Aluminum cobalt lithium magnesium oxide (Al0.01Co0.98LiMg0.01O2)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.98	7440-48-4
Mg	0.01	7439-95-4
Li	1	7439-93-2
Al	0.01	7429-90-5

INCL 429316000; 429231950; 429231100; 429224000; 429223000; 429231600;  
429231500; 429220000; 429221000; 429229000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 38

ST battery secondary

IT Battery cathodes

Battery electrolytes  
(battery)

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate

## 10/594,489-266327-EIC 1700 SEARCH

9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer  
 12190-79-3, Cobalt lithium oxide (CoLiO<sub>2</sub>)  
 21324-40-3, Lithium hexafluorophosphate  
 RL: DEV (Device component use); USES (Uses)  
 (battery)

IT 346417-97-8P, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.33</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 372492-00-7P, Aluminum cobalt  
 lithium magnesium oxide (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (battery)

L60 ANSWER 20 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2006:918270 HCAPLUS Full-text

DOCUMENT NUMBER: 145:274968

TITLE: Nonaqueous electrolyte  
 secondary battery

INVENTOR(S): Iwanaga, Masato; Nishida, Nobumichi; Tsutsumi,  
 Shuji

PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan

SOURCE: U.S. Pat. Appl. Publ., 9pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 20060199077	A1	20060907	US 2006-359965	2006 0223
JP 2006236725	A	20060907	JP 2005-48171	2005 0224
KR 2006094477	A	20060829	KR 2006-17530	2006 0223
CN 1825675	A	20060830	CN 2006-10009554	2006 0224
PRIORITY APPLN. INFO.:			JP 2005-48171	A 2005 0224

ED Entered STN: 08 Sep 2006

AB The invention concerns a non-aqueous electrolyte secondary battery with excellent discharge cycle characteristics and a charging termination potential ranging from 4.4 to 4.6 V based on lithium, consisting of a pos. electrode comprising a pos. electrode active material, a neg. electrode, and a non-aqueous electrolyte containing a non-aqueous solvent and an electrolyte salt, in which the pos. electrode active material comprises a mixture of a lithium-cobalt composite oxide containing at least both zirconium and magnesium in LiCoO<sub>2</sub>, and a lithium-manganese-nickel composite oxide having a layered structure and containing at least both manganese and nickel, and the potential of the pos. electrode active material ranges from 4.4 to 4.6 V based on lithium, and the non-aqueous electrolyte contains at least one of aromatic compds. selected from the group consisting at least of toluene derivs., anisole derivs., biphenyl, cyclohexyl benzene, tert-Bu benzene, tert-amyl benzene, and di-Ph ether.

IT 182442-95-1, Cobalt lithium manganese nickel oxide  
 532934-38-6, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 642999-33-5, Cobalt lithium  
 magnesium zirconium oxide

RL: DEV (Device component use); USES (Uses)

(nonaq. electrolyte secondary  
 battery)

## 10/594,489-266327-EIC 1700 SEARCH

RN 182442-95-1 HCAPLUS

CN Cobalt lithium manganese nickel oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Co	x	7440-48-4
Ni	x	7440-02-0
Mn	x	7439-96-5
Li	x	7439-93-2

RN 532934-38-6 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	0.34	7440-48-4
Ni	0.33	7440-02-0
Mn	0.33	7439-96-5
Li	1	7439-93-2

RN 642999-33-5 HCAPLUS

CN Cobalt lithium magnesium zirconium oxide (CA INDEX NAME)

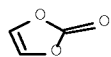
Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Zr	x	7440-67-7
Co	x	7440-48-4
Mg	x	7439-95-4
Li	x	7439-93-2

IT 872-36-6, Vinylene carbonate

RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. electrolyte secondary  
battery)

RN 872-36-6 HCAPLUS

CN 1,3-Dioxol-2-one (CA INDEX NAME)



INCL 429231300; 429231600; 429224000; 429223000; 429326000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST nonaq electrolyte secondary  
battery

IT Battery cathodes

Battery electrolytes

Secondary batteries

(nonaq. electrolyte secondary  
battery)

IT Aromatic compounds

RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. electrolyte secondary  
battery)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate

623-53-0, Ethyl methyl carbonate 162684-16-4, Lithium manganese

## 10/594,489-266327-EIC 1700 SEARCH

nickel oxide 182442-95-1, Cobalt lithium manganese  
 nickel oxide 532934-38-6, Cobalt lithium manganese  
 nickel oxide (Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 642999-33-5,  
 Cobalt lithium magnesium zirconium oxide  
 RL: DEV (Device component use); USES (Uses)  
 (nonaq. electrolyte secondary  
 battery)

IT 92-52-4, Biphenyl, uses 98-06-6, tert-Butylbenzene 100-66-3D,  
 Anisole, derivative 101-84-8, Diphenyl ether 108-88-3D, Toluene,  
 derivative 827-52-1, Cyclohexylbenzene 872-36-6, Vinylene  
 carbonate 2049-95-8, tert-Amylbenzene  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (nonaq. electrolyte secondary  
 battery)

L60 ANSWER 21 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2006:890059 HCAPLUS Full-text

DOCUMENT NUMBER: 145:274867

TITLE: Nonaqueous electrolyte  
 secondary battery

INVENTOR(S): Oga, Keisuke; Iwanaga, Masato; Inomata,  
 Hideyuki; Ohshita, Ryuji

PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan

SOURCE: U.S. Pat. Appl. Publ., 6 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO. -----	KIND ----	DATE -----	APPLICATION NO. -----	DATE
US 20060194111	A1	20060831	US 2006-362225	2006 0227
JP 2006244723	A	20060914	JP 2005-54381	2005 0228
KR 2006095462	A	20060831	KR 2006-15179	2006 0216
CN 1848511	A	20061018	CN 2006-10051464	2006 0228

PRIORITY APPLN. INFO.: JP 2005-54381 A  
 2005  
 0228

ED Entered STN: 01 Sep 2006

AB A non-aqueous electrolyte secondary cell excellent in cycle characteristics is provided. This purpose is achieved by the following structure. A non-aq. electrolyte secondary cell has a pos. electrode having a pos. electrode active material, a neg. electrode having a neg. electrode active material, and a non-aqueous electrolyte having a non-aqueous solvent and an electrolytic salt. The pos. electrode active material has a lithium-cobalt compound oxide having added therein at least zirconium. The non-aqueous electrolyte has LiBF<sub>4</sub> at from 0.05 to 1.0 mass% of a total mass of the non-aqueous electrolyte and unsatd. cyclic carbonate at from 1.0 to 4.0 mass%. The true d. ratio of the pos. electrode is 0.72 or greater, the true d. ratio being represented by formula 1 shown below: (Formula 1) True d. ratio=active material apparent d. of electrode active material layer/true d. of active material.

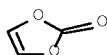
IT 872-36-6, Vinylene carbonate 52627-24-4, Cobalt  
 lithium oxide

RL: DEV (Device component use); USES (Uses)  
 (nonaq. electrolyte secondary  
 battery)

RN 872-36-6 HCAPLUS

## 10/594,489-266327-EIC 1700 SEARCH

CN 1,3-Dioxol-2-one (CA INDEX NAME)



RN 52627-24-4 HCAPLUS

CN Cobalt lithium oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Co	x	7440-48-4
Li	x	7439-93-2

IT 642999-33-5P, Cobalt lithium magnesium zirconium oxide

RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(nonaq. electrolyte secondary  
battery)

RN 642999-33-5 HCAPLUS

CN Cobalt lithium magnesium zirconium oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Zr	x	7440-67-7
Co	x	7440-48-4
Mg	x	7439-95-4
Li	x	7439-93-2

INCL 429231300; 429231600

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST nonaq electrolyte secondary  
battery

IT Battery cathodes

Secondary batteries  
(nonaq. electrolyte secondary  
battery)

IT Fluoropolymers, uses

Styrene-butadiene rubber, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. electrolyte secondary  
battery)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
623-53-0, Ethyl methyl carbonate 872-36-6, Vinylene  
carbonate 7429-90-5, Aluminum, uses 7782-42-5, Graphite, uses  
7791-03-9 14283-07-9, Lithium tetrafluoroborate 21324-40-3,  
Lithium hexafluorophosphate 52627-24-4, Cobalt lithium  
oxide 90076-65-6 132843-44-8

RL: DEV (Device component use); USES (Uses)  
(nonaq. electrolyte secondary  
battery)

IT 642999-33-5P, Cobalt lithium magnesium zirconium oxide

RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(nonaq. electrolyte secondary  
battery)

IT 98-06-6, tert-Butylbenzene 827-52-1, Cyclohexylbenzene  
7439-95-4, Magnesium, uses 7440-44-0, Carbon, uses 7440-67-7,  
Zirconium, uses 9000-11-7, CMC 24937-79-9, PvdF

## 10/594,489-266327-EIC 1700 SEARCH

RL: MOA (Modifier or additive use); USES (Uses)  
 (nonaq. electrolyte secondary  
 battery)

IT 9003-55-8

RL: MOA (Modifier or additive use); USES (Uses)  
 (styrene-butadiene rubber; nonaq. electrolyte  
 secondary battery)

L60 ANSWER 22 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2006:759804 HCAPLUS Full-text

DOCUMENT NUMBER: 145:170774

TITLE: Secondary lithium batteries capable of  
 high-voltage charging, and their charging  
 method

INVENTOR(S): Nakagawa, Hiroshi; Asaoka, Kenji; Imai,  
 Katsuya

PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 15 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
JP 2006202529	A	20060803	JP 2005-10417	2005 0118

PRIORITY APPLN. INFO.:

JP 2005-10417

2005  
0118

ED Entered STN: 03 Aug 2006

AB The batteries employ cathode active mass which contain mixts. of Zr- and Mg-containing  
 Li Co oxides, and layered Li Mn Ni oxides, and show 4.4-4.6 V potential (vs. Li), and  
 ammonia-released CM-cellulose ammonium salt as anode binder. The batteries are charged  
 at 4.4-4.6 V potential (vs. Li). The batteries show good charge-discharge cycling  
 characteristics.

IT 532934-38-6P, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 642999-33-5P, Cobalt lithium  
 magnesium zirconium oxide

RL: DEV (Device component use); PNU (Preparation, unclassified);

PREP (Preparation); USES (Uses)

(cathode active mass; secondary Li battery with cathode containing  
 Li Co Zr Mg oxide and Li Mn Ni oxide, and CM-cellulose anode  
 binder)

RN 532934-38-6 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
 (CA INDEX NAME)

Component	Ratio	Component
-----	-----	-----
		Registry Number
O	2	17778-80-2
Co	0.34	7440-48-4
Ni	0.33	7440-02-0
Mn	0.33	7439-96-5
Li	1	7439-93-2

RN 642999-33-5 HCAPLUS

CN Cobalt lithium magnesium zirconium oxide (CA INDEX NAME)

Component	Ratio	Component
-----	-----	-----
		Registry Number

## 10/594,489-266327-EIC 1700 SEARCH

O		x		17778-80-2
Zr		x		7440-67-7
Co		x		7440-48-4
Mg		x		7439-95-4
Li		x		7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 IT 532934-38-6P, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>) 642999-33-5P, Cobalt lithium  
 magnesium zirconium oxide  
 RL: DEV (Device component use); PNU (Preparation, unclassified);  
 PREP (Preparation); USES (Uses)  
 (cathode active mass; secondary Li battery with cathode containing  
 Li Co Zr Mg oxide and Li Mn Ni oxide, and CM-cellulose anode  
 binder)

L60 ANSWER 23 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2006:517317 HCAPLUS Full-text  
 DOCUMENT NUMBER: 145:11312  
 TITLE: Method of charging nonaqueous  
 electrolyte secondary  
 battery  
 INVENTOR(S): Nishida, Nobumichi; Inoue, Hidetoshi  
 PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan  
 SOURCE: U.S. Pat. Appl. Publ., 7 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
US 20060115733	A1	20060601	US 2005-288355	2005 1129
JP 2006156230	A	20060615	JP 2004-347187	2004 1130
KR 2006060559	A	20060605	KR 2005-100878	2005 1025
CN 1783548	A	20060607	CN 2005-10127178	2005 1130
PRIORITY APPLN. INFO.:			JP 2004-347187	A 2004 1130

ED Entered STN: 02 Jun 2006

AB The invention provides a non-aqueous electrolyte secondary cell that has high capacity and excels in cycle characteristics. The non-aqueous electrolyte secondary cell functions stably at a high potential of from 4.4 to 4.6 V with respect to lithium and inhibits the decomposition of the electrolytic solution at high potential. This is accomplished as follows. The non-aqueous electrolyte secondary cell has a pos. electrode having a pos. electrode active material; a neg. electrode having a neg. electrode active material; and a non-aqueous electrolyte having a non-aqueous solvent and electrolytic salt. The pos. electrode active material has: lithium cobalt compound oxide having added therein at least zirconium and magnesium; and lithium-nickel-manganese compound oxide having a layered structure. The pos. electrode active material has a potential of from 4.4 to 4.6 V with respect to lithium. The non-aqueous solvent contains di-Et carbonate of 10 volume% or higher at 25°.

IT 642999-33-5, Cobalt lithium magnesium zirconium oxide  
 RL: DEV (Device component use); USES (Uses)  
 (method of charging nonaq. electrolyte  
 secondary battery)

## 10/594,489-266327-EIC 1700 SEARCH

RN 642999-33-5 HCAPLUS

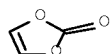
CN Cobalt lithium magnesium zirconium oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	x	17778-80-2
Zr	x	7440-67-7
Co	x	7440-48-4
Mg	x	7439-95-4
Li	x	7439-93-2

IT 872-36-6, Vinylene carbonate  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (method of charging nonaq. electrolyte  
 secondary battery)

RN 872-36-6 HCAPLUS

CN 1,3-Dioxol-2-one (CA INDEX NAME)



INCL 429231100; 429231300; 429326000; 429332000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST nonaq electrolyte secondary  
 battery charging method

IT Battery anodes  
 Battery cathodes  
 Secondary batteries  
 (method of charging nonaq. electrolyte  
 secondary battery)

IT Carbonaceous materials (technological products)  
 RL: DEV (Device component use); USES (Uses)  
 (method of charging nonaq. electrolyte  
 secondary battery)

IT 887748-06-3, Cobalt manganese nickel hydroxide  
 (Co<sub>0.34</sub>Mn<sub>0.33</sub>Ni<sub>0.33</sub>(OH)<sub>2</sub>)  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
 process); PROC (Process)  
 (method of charging nonaq. electrolyte  
 secondary battery)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
 623-53-0, Ethyl methyl carbonate 7782-42-5, Graphite, uses  
 147683-99-6, Cobalt lithium zirconium oxide 162684-16-4, Lithium  
 manganese nickel oxide 642999-33-5, Cobalt lithium  
 magnesium zirconium oxide  
 RL: DEV (Device component use); USES (Uses)  
 (method of charging nonaq. electrolyte  
 secondary battery)

IT 872-36-6, Vinylene carbonate  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (method of charging nonaq. electrolyte  
 secondary battery)

L60 ANSWER 24 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2006:470248 HCAPLUS Full-text

DOCUMENT NUMBER: 144:471465

TITLE: Nonaqueous electrolyte  
 secondary battery

INVENTOR(S): Tode, Shingo; Fujimoto, Hiroyuki; Takahashi,  
 Yasufumi; Kinoshita, Akira; Hasegawa,  
 Kazuhiro; Fujitani, Shin

## 10/594,489-266327-EIC 1700 SEARCH

PATENT ASSIGNEE(S): Japan  
 SOURCE: U.S. Pat. Appl. Publ., 11 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20060105241	A1	20060518	US 2005-168380	2005 0629
JP 2006164934	A	20060622	JP 2005-60288	2005 0304
KR 2006048698	A	20060518	KR 2005-57003	2005 0629
CN 1773765	A	20060517	CN 2005-10080727	2005 0630
PRIORITY APPLN. INFO.:			JP 2004-329406	A 2004 1112
			JP 2005-60288	A 2005 0304

ED Entered STN: 19 May 2006

AB A nonaq. electrolyte secondary battery comprises a pos. electrode containing a pos. active material, a neg. electrode containing a neg. active material and a nonaq. electrolyte, wherein a lithium transition metal complex oxide A formed by allowing LiCoO<sub>2</sub> to contain at least both of Zr and Mg and a lithium transition metal complex oxide B having a layered structure and containing at least both of Mn and Ni as transition metals and containing Mo are mixed and used as the pos. active material.

IT 477700-15-5P, Cobalt lithium oxide (Co<sub>0.99</sub>LiO<sub>2</sub>)

RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (Mg- and Zr-doped; nonaq. electrolyte  
 secondary battery)

RN 477700-15-5 HCAPLUS

CN Cobalt lithium oxide (Co<sub>0.99</sub>LiO<sub>2</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.99	7440-48-4
Li	1	7439-93-2

IT 372492-00-7P, Aluminum cobalt lithium magnesium oxide  
 (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>)

RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (Zr-doped; nonaq. electrolyte  
 secondary battery)

RN 372492-00-7 HCAPLUS

CN Aluminum cobalt lithium magnesium oxide (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>)  
 (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2

## 10/594,489-266327-EIC 1700 SEARCH

Co		0.98		7440-48-4
Mg		0.01		7439-95-4
Li		1		7439-93-2
Al		0.01		7429-90-5

IT 756879-33-1 886752-61-0 886752-62-1

RL: DEV (Device component use); USES (Uses)  
 (nonaq. electrolyte secondary  
 battery)

RN 756879-33-1 HCAPLUS

CN Aluminum cobalt lithium magnesium zirconium oxide (CA INDEX NAME)

Component		Ratio		Component Registry Number
O		x		17778-80-2
Zr		x		7440-67-7
Co		x		7440-48-4
Mg		x		7439-95-4
Li		x		7439-93-2
Al		x		7429-90-5

RN 886752-61-0 HCAPLUS

CN Cobalt lithium magnesium titanium zirconium oxide (CA INDEX NAME)

Component		Ratio		Component Registry Number
O		x		17778-80-2
Zr		x		7440-67-7
Co		x		7440-48-4
Ti		x		7440-32-6
Mg		x		7439-95-4
Li		x		7439-93-2

RN 886752-62-1 HCAPLUS

CN Cobalt lithium magnesium tin zirconium oxide (CA INDEX NAME)

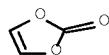
Component		Ratio		Component Registry Number
O		x		17778-80-2
Zr		x		7440-67-7
Co		x		7440-48-4
Sn		x		7440-31-5
Mg		x		7439-95-4
Li		x		7439-93-2

IT 872-36-6, Vinylene carbonate 532934-38-6, Cobalt  
 lithium manganese nickel oxide (Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)

RL: MOA (Modifier or additive use); USES (Uses)  
 (nonaq. electrolyte secondary  
 battery)

RN 872-36-6 HCAPLUS

CN 1,3-Dioxol-2-one (CA INDEX NAME)



RN 532934-38-6 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
 (CA INDEX NAME)

## 10/594,489-266327-EIC 1700 SEARCH

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.34	7440-48-4
Ni	0.33	7440-02-0
Mn	0.33	7439-96-5
Li	1	7439-93-2

INCL 429231300; 429231600; 429223000; 429224000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST nonaq electrolyte secondary  
battery

IT Transition metal oxides

RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(lithiated; nonaq. electrolyte  
secondary battery)

IT Secondary batteries  
(lithium; nonaq. electrolyte  
secondary battery)

IT Battery cathodes  
(nonaq. electrolyte secondary  
battery)

IT 477700-15-5P, Cobalt lithium oxide (Co<sub>0.99</sub>LiO<sub>2</sub>)  
RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(Mg- and Zr-doped; nonaq. electrolyte  
secondary battery)

IT 372492-00-7P, Aluminum cobalt lithium magnesium oxide  
(Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>)  
RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(Zr-doped; nonaq. electrolyte  
secondary battery)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
623-53-0, Ethyl methyl carbonate 756879-33-1  
864452-44-8 886752-61-0 886752-62-1  
RL: DEV (Device component use); USES (Uses)  
(nonaq. electrolyte secondary  
battery)

IT 886752-63-2P  
RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(nonaq. electrolyte secondary  
battery)

IT 872-36-6, Vinylene carbonate 7439-95-4, Magnesium, uses  
7440-67-7, Zirconium, uses 532934-38-6, Cobalt lithium  
manganese nickel oxide (Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>2</sub>)  
RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. electrolyte secondary  
battery)

L60 ANSWER 25 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2006:470245 HCAPLUS Full-text

DOCUMENT NUMBER: 144:471464

TITLE: Nonaqueous electrolyte  
secondary battery

INVENTOR(S): Kinoshita, Akira; Fujimoto, Hiroyuki;  
Takahashi, Yasufumi; Tode, Shingo; Hasegawa,  
Kazuhiro; Fujitani, Shin

PATENT ASSIGNEE(S): Japan

SOURCE: U.S. Pat. Appl. Publ., 11 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

## 10/594,489-266327-EIC 1700 SEARCH

FAMILY ACC. NUM. COUNT: 1

## PATENT INFORMATION:

PATENT NO. -----	KIND ----	DATE -----	APPLICATION NO. -----	DATE
US 20060105240	A1	20060518	US 2005-140064	2005 0531
JP 2006147191	A	20060608	JP 2004-332208	2004 1116
KR 2006055301	A	20060523	KR 2005-45568	2005 0530
CN 1776954	A	20060524	CN 2005-10073453	2005 0530
EP 1662600	A1	20060531	EP 2005-11719	2005 0531
EP 1662600	B1	20070411		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, BA, HR, IS, YU				

PRIORITY APPLN. INFO.: JP 2004-332208 A  
2004  
1116

ED Entered STN: 19 May 2006

AB A nonaq. electrolyte secondary battery includes a pos. electrode containing a pos. active material, a neg. electrode containing a neg. active material and a non-aqueous electrolyte, characterized in that lithium transition metal complex oxide A formed by allowing LiCoO<sub>2</sub> to contain at least both of Zr and Mg and lithium transition metal complex oxide B having a layered structure and containing at least both of Mn and Ni as transition metals are mixed and used as the pos. active material, and vinylene carbonate and divinyl sulfone are contained in the non-aqueous electrolyte .

IT 477700-15-5P, Cobalt lithium oxide (Co<sub>0.99</sub>LiO<sub>2</sub>)

RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(Mg- and Zr-doped; nonaq. electrolyte secondary battery)

RN 477700-15-5 HCAPLUS

CN Cobalt lithium oxide (Co<sub>0.99</sub>LiO<sub>2</sub>) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.99	7440-48-4
Li	1	7439-93-2

IT 182442-95-1, Cobalt lithium manganese nickel oxide

RL: DEV (Device component use); USES (Uses)  
(nonaq. electrolyte secondary battery)

RN 182442-95-1 HCAPLUS

CN Cobalt lithium manganese nickel oxide (CA INDEX NAME)

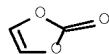
Component	Ratio	Component Registry Number
O	x	17778-80-2
Co	x	7440-48-4
Ni	x	7440-02-0
Mn	x	7439-96-5
Li	x	7439-93-2

## 10/594,489-266327-EIC 1700 SEARCH

IT 532934-38-6P, Cobalt lithium manganese nickel oxide  
(Co0.34LiMn0.33Ni0.33O2)  
RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(nonaq. electrolyte secondary  
battery)  
RN 532934-38-6 HCAPLUS  
CN Cobalt lithium manganese nickel oxide (Co0.34LiMn0.33Ni0.33O2)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.34	7440-48-4
Ni	0.33	7440-02-0
Mn	0.33	7439-96-5
Li	1	7439-93-2

IT 872-36-6, Vinylene carbonate  
RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. electrolyte secondary  
battery)  
RN 872-36-6 HCAPLUS  
CN 1,3-Dioxol-2-one (CA INDEX NAME)



INCL 429231300; 429231600; 429223000; 429224000; 429324000; 429330000;  
429340000  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST nonaq electrolyte secondary  
battery  
IT Transition metal oxides  
RL: DEV (Device component use); USES (Uses)  
(lithiated; nonaq. electrolyte  
secondary battery)  
IT Secondary batteries  
(lithium; nonaq. electrolyte  
secondary battery)  
IT Battery cathodes  
Battery electrolytes  
(nonaq. electrolyte secondary  
battery)  
IT 477700-15-5P, Cobalt lithium oxide (Co0.99LiO2)  
RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(Mg- and Zr-doped; nonaq. electrolyte  
secondary battery)  
IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
623-53-0, Ethyl methyl carbonate 7782-42-5, Graphite, uses  
182442-95-1, Cobalt lithium manganese nickel oxide  
RL: DEV (Device component use); USES (Uses)  
(nonaq. electrolyte secondary  
battery)  
IT 532934-38-6P, Cobalt lithium manganese nickel oxide  
(Co0.34LiMn0.33Ni0.33O2)  
RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(nonaq. electrolyte secondary

## 10/594,489-266327-EIC 1700 SEARCH

battery)  
 IT 55-98-1 77-77-0, Divinyl sulfone 372-36-6, Vinylene  
 carbonate 7439-95-4, Magnesium, uses 7440-67-7, Zirconium,  
 uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (nonaq. electrolyte secondary  
 battery)

L60 ANSWER 26 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2005:1262422 HCAPLUS Full-text  
 DOCUMENT NUMBER: 143:480471  
 TITLE: Nonaqueous electrolyte  
 secondary battery  
 INVENTOR(S): Kitao, Hideki; Fujihara, Toyoki; Takeda,  
 Kazuhisa; Nakanishi, Naoya; Nohma, Toshiyuki  
 PATENT ASSIGNEE(S): Japan  
 SOURCE: U.S. Pat. Appl. Publ., 6 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO. -----	KIND ----	DATE -----	APPLICATION NO. -----	DATE
US 20050266313	A1	20051201	US 2005-138268	2005 0527
JP 2005340055	A	20051208	JP 2004-158780	2004 0528
CN 1702905	A	20051130	CN 2005-10074304	2005 0525
KR 2006048132	A	20060518	KR 2005-44816	2005 0527
PRIORITY APPLN. INFO.:			JP 2004-158780	A 2004 0528

ED Entered STN: 02 Dec 2005

AB In a non-aqueous electrolyte  
 secondary battery using a layered lithium-transition metal composite oxide as a pos.  
 electrode active material, elevated-temperature durability, i.e., elevated-temperature  
 storage performance is enhanced without degrading battery capacity. The non-aqueous  
 electrolyte secondary battery includes: a pos. electrode including, as a pos. electrode  
 active material, layered lithium-transition metal composite oxide containing lithium,  
 nickel, and manganese; a neg. electrode active material capable of intercalating and  
 deintercalating lithium; and a non-aqueous electrolyte having lithium ion conductivity,  
 and the lithium-transition metal composite oxide contains a group IVA element and a  
 group IIA element of the periodic table.

IT 217309-43-8P, Cobalt lithium manganese nickel oxide  
 (Co<sub>0.3</sub>LiMn<sub>0.3</sub>Ni<sub>0.4</sub>O<sub>2</sub>)  
 RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (Mn- and Zr-doped; nonaq. electrolyte  
 secondary battery)

RN 217309-43-8 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co<sub>0.3</sub>LiMn<sub>0.3</sub>Ni<sub>0.4</sub>O<sub>2</sub>) (CA  
 INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2

## 10/594,489-266327-EIC 1700 SEARCH

Co		0.3		7440-48-4
Ni		0.4		7440-02-0
Mn		0.3		7439-96-5
Li		1		7439-93-2

IT 869792-63-2P

RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(nonaq. electrolyte secondary  
battery)

RN 869792-63-2 HCAPLUS

CN Cobalt lithium magnesium manganese nickel zirconium oxide (CA  
INDEX NAME)

Component		Ratio		Component Registry Number
=====	+	=====	+	=====
O		x		17778-80-2
Zr		x		7440-67-7
Co		x		7440-48-4
Ni		x		7440-02-0
Mn		x		7439-96-5
Mg		x		7439-95-4
Li		x		7439-93-2

IC ICM H01M004-52

ICS H01M004-50

INCL 429231100; 429223000; 429224000; 429231500; 429231600; 429231300

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 49

ST nonaq electrolyte secondary  
battery

IT Secondary batteries  
(lithium; nonaq. electrolyte  
secondary battery)

IT Battery cathodes  
(nonaq. electrolyte secondary  
battery)

IT 217309-43-8P, Cobalt lithium manganese nickel oxide  
(Co<sub>0.3</sub>LiMn<sub>0.3</sub>Ni<sub>0.4</sub>O<sub>2</sub>)

RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(Mn- and Zr-doped; nonaq. electrolyte  
secondary battery)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
7782-42-5, Graphite, uses 21324-40-3, Lithium  
hexafluorophosphate 362666-83-9, Aluminum lithium manganese  
oxide (Al<sub>0.1</sub>Li<sub>1.1</sub>Mn<sub>1.8</sub>O<sub>4</sub>)

RL: DEV (Device component use); USES (Uses)  
(nonaq. electrolyte secondary  
battery)

IT 869792-63-2P

RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
(Preparation); USES (Uses)  
(nonaq. electrolyte secondary  
battery)

IT 7439-96-5, Manganese, uses 7440-67-7, Zirconium, uses

RL: MOA (Modifier or additive use); USES (Uses)  
(nonaq. electrolyte secondary  
battery)

L60 ANSWER 27 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2005:1102902 HCAPLUS Full-text

DOCUMENT NUMBER: 143:329274

TITLE: Secondary nonaqueous  
electrolyte battery

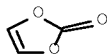
INVENTOR(S): Abe, Hiroshi; Miyoshi, Kazuhiro; Takahashi,

## 10/594,489-266327-EIC 1700 SEARCH

Yasufumi; Fujimoto, Hiroyuki; Kinoshita,  
Akira; Toide, Shingo; Nakane, Ikuro; Fujitani,  
Shin  
PATENT ASSIGNEE(S): Ube Industries, Ltd., Japan; Sanyo Electric  
Co., Ltd.  
SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005285630	A	20051013	JP 2004-99430	2004 0330
CA 2525923	A1	20050930	CA 2005-2525923	2005 0218
WO 2005099021	A1	20051020	WO 2005-JP2576	2005 0218
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CN 1806361	A	20060719	CN 2005-80000453	2005 0218
EP 1739783	A1	20070103	EP 2005-710409	2005 0218
US 20060166096	A1	20060727	US 2006-563124	2006 0103
KR 2007004796	A	20070109	KR 2006-720316	2006 0929
PRIORITY APPLN. INFO.:			JP 2004-99430	A 2004 0330
			WO 2005-JP2576	W 2005 0218

ED Entered STN: 14 Oct 2005  
 AB The battery has a graphite anode, a LiCoO<sub>2</sub> based cathode, and a nonaq. electrolyte  
 solution; where the LiCoO<sub>2</sub> contains Group IIA and Group IVA elements, and the  
 electrolyte solution contains 0.2-1.5% of a compound having sulfonyl group.  
 IT 372-36-6, Vinylene carbonate  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte solns. containing sulfonyl compound for  
 secondary lithium batteries)  
 RN 872-36-6 HCAPLUS  
 CN 1,3-Dioxol-2-one (CA INDEX NAME)



IT 642999-33-5, Cobalt lithium magnesium zirconium oxide  
 RL: DEV (Device component use); USES (Uses)  
 (magnesium and zirconium containing lithium cobaltate  
 cathodes for secondary lithium  
 batteries)  
 RN 642999-33-5 HCAPLUS  
 CN Cobalt lithium magnesium zirconium oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Zr	x	7440-67-7
Co	x	7440-48-4
Mg	x	7439-95-4
Li	x	7439-93-2

IC ICM H01M010-40  
 ICS H01M004-02; H01M004-58  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST battery cathode lithium cobalt zinc  
 magnesium oxide; sulfonyl compd electrolyte soln secondary  
 lithium battery  
 IT Battery electrolytes  
 (electrolyte solns. containing sulfonyl compound for  
 secondary lithium batteries)  
 IT Secondary batteries  
 (lithium; secondary lithium  
 batteries with magnesium and zirconium containing  
 lithium cobaltate cathodes and sulfonyl  
 compound containing electrolyte solns.)  
 IT Battery cathodes  
 (magnesium and zirconium containing lithium cobaltate  
 cathodes for secondary lithium  
 batteries)  
 IT 77-77-0, Divinyl sulfone 96-49-1, Ethylene carbonate 105-58-8,  
 Diethyl carbonate 872-36-6, Vinylene carbonate  
 21324-40-3, Lithium hexafluorophosphate 433304-54-2  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte solns. containing sulfonyl compound for  
 secondary lithium batteries)  
 IT 642999-33-5, Cobalt lithium magnesium zirconium oxide  
 RL: DEV (Device component use); USES (Uses)  
 (magnesium and zirconium containing lithium cobaltate  
 cathodes for secondary lithium  
 batteries)

L60 ANSWER 28 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2005:1076074 HCAPLUS Full-text  
 DOCUMENT NUMBER: 143:369992  
 TITLE: Secondary nonaqueous  
 electrolyte battery  
 INVENTOR(S): Takahashi, Yasufumi; Kinoshita, Akira; Tode,  
 Shingo; Hasegawa, Kazuhiro; Fujimoto,  
 Hiroyuki; Nakane, Ikuro; Fujitani, Shin  
 PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan  
 SOURCE: PCT Int. Appl., 25 pp.  
 CODEN: PIXXD2

## 10/594,489-266327-EIC 1700 SEARCH

DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005093880	A1	20051006	WO 2005-JP3723	2005 0304
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
JP 2005317499	A	20051110	JP 2004-320394	2004 1104
EP 1734601	A1	20061220	EP 2005-719995	2005 0304
R: DE, FR, GB				
CN 1934733	A	20070321	CN 2005-80009615	2005 0304
US 20070196736	A1	20070823	US 2006-594459	2006 0926
PRIORITY APPLN. INFO.:			JP 2004-94475	A 2004 0329
			JP 2004-320394	A 2004 1104
			WO 2005-JP3723	W 2005 0304

ED Entered STN: 07 Oct 2005

AB The battery uses a cathode active mass comprising a substituted LiCoO<sub>2</sub>, containing at least Zr and Mg, and a layer structured Li transition metal oxide containing at least Mn and/or Ni. Preferably, the substituted LiCoO<sub>2</sub> is Li<sub>a</sub>Co<sub>1-x-y-z</sub>R<sub>x</sub>Mg<sub>y</sub>MzO<sub>2</sub>, where M = Al, Ti, and/or Sn, za ≤ 1.1, x > 0, Y > 0, Z > 0 and (x+y+z) ≤ 0.03; and the Li transition metal oxide is LibMnsNitCouO<sub>2</sub>, where b ≤ 1.2, 0 < s ≤ 0.5, 0 < t ≤ 0.5, u ≥ 0, and (ss+t+u) = 1.

IT 372492-00-7, Aluminum cobalt lithium magnesium oxide (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>) 477700-15-S, Cobalt lithium oxide (Co<sub>0.99</sub>LiO<sub>2</sub>) 366331-36-4, Cobalt lithium manganese nickel oxide (Co<sub>0.34</sub>LiMn<sub>0.33</sub>Ni<sub>0.33</sub>O<sub>3</sub>)

RL: DEV (Device component use); USES (Uses)  
 (mixts. of lithium transition metal oxides for secondary lithium battery cathodes)

RN 372492-00-7 HCAPLUS

CN Aluminum cobalt lithium magnesium oxide (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>)  
 (CA INDEX NAME)

## 10/594,489-266327-EIC 1700 SEARCH

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.98	7440-48-4
Mg	0.01	7439-95-4
Li	1	7439-93-2
Al	0.01	7429-90-5

RN 477700-15-5 HCAPLUS  
 CN Cobalt lithium oxide (Co0.99LiO2) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.99	7440-48-4
Li	1	7439-93-2

RN 866331-36-4 HCAPLUS  
 CN Cobalt lithium manganese nickel oxide (Co0.34LiMn0.33Ni0.33O3)  
 (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Co	0.34	7440-48-4
Ni	0.33	7440-02-0
Mn	0.33	7439-96-5
Li	1	7439-93-2

IC ICM H01M004-58  
 ICS H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST secondary lithium battery  
 cathode active mass oxide mixt; lithium cobalt zirconium  
 magnesium oxide battery cathode; cobalt lithium  
 manganese nickel oxide battery cathode  
 IT Battery cathodes  
 (mixts. of lithium transition metal oxides for  
 secondary lithium battery  
 cathodes)  
 IT 372492-00-7, Aluminum cobalt lithium magnesium oxide  
 (Al0.01Co0.98LiMg0.01O2) 477700-15-5, Cobalt lithium  
 oxide (Co0.99LiO2) 866331-36-4, Cobalt lithium manganese  
 nickel oxide (Co0.34LiMn0.33Ni0.33O3)  
 RL: DEV (Device component use); USES (Uses)  
 (mixts. of lithium transition metal oxides for  
 secondary lithium battery  
 cathodes)  
 REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE  
 FOR THIS RECORD. ALL CITATIONS AVAILABLE  
 IN THE RE FORMAT

L60 ANSWER 29 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2005:726431 HCAPLUS Full-text  
 DOCUMENT NUMBER: 143:176285  
 TITLE: Nonaqueous electrolyte  
 secondary lithium  
 batteries with excellent charge  
 storage  
 INVENTOR(S): Yanai, Atsushi; Yanagida, Katsunori; Kita,  
 Yoshinori; Noma, Toshiyuki  
 PATENT ASSIGNEE(S): Sanyo Electric Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 16 pp.

## 10/594,489-266327-EIC 1700 SEARCH

DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005216795	A	20050811	JP 2004-25189	2004 0202
PRIORITY APPLN. INFO.:				JP 2004-25189 2004 0202

ED Entered STN: 11 Aug 2005

AB The batteries comprise a Li-intercalating anode with active materials having BET surface area of  $\leq 5.0$  m<sup>2</sup>/g, a Li-containing transition metal oxide cathode, and nonaq. electrolytes with their solvents containing  $\geq 50$  volume%  $\gamma$ -butyrolactone and are characterized by the value of the depth of discharge (DOD) showing min.  $dV/d(DOD)$  ( $V$  = battery voltage on 5-h rate discharging;  $DOD = 10-80\%$ ;  $dV/d(DOD) < -0.015$ ) (R) being 10-16.8% of DOD. Preferably, the cathode active material is Li-containing Co oxides or contain  $\geq 1$  element(s) selected from Groups 2, 4, 7, 8, 9, 10, 12, 13, and 14 elements. Cathode side reaction is prevented under the given DOD conditions.

IT 52627-24-4P, Cobalt lithium oxide 642999-33-5P,  
 Cobalt lithium magnesium zirconium oxide  
 RL: DEV (Device component use); IMF (Industrial manufacture); PREP (Preparation); USES (Uses)  
 (cathode active material; nonaq.  
 $\gamma$ -butyrolactone electrolyte secondary  
 lithium batteries with excellent charge  
 storage)

RN 52627-24-4 HCAPLUS

CN Cobalt lithium oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Co	x	7440-48-4
Li	x	7439-93-2

RN 642999-33-5 HCAPLUS

CN Cobalt lithium magnesium zirconium oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Zr	x	7440-67-7
Co	x	7440-48-4
Mg	x	7439-95-4
Li	x	7439-93-2

IC ICM H01M010-40

ICS H01M004-02; H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST nonaq electrolyte secondary  
 lithium battery charge storage high;  
 butyrolactone nonaq electrolyte solvent  
 secondary lithium battery; cobalt  
 lithium oxide cathode secondary  
 lithium battery

IT Transition metal oxides

RL: DEV (Device component use); USES (Uses)

# 10/594,489-266327-EIC 1700 SEARCH

(cathode active materials containing; nonaq.  
 $\gamma$ -butyrolactone electrolyte secondary  
lithium batteries with excellent charge  
storage)

IT Secondary batteries  
(lithium; nonaq.  $\gamma$ -butyrolactone  
electrolyte secondary lithium  
batteries with excellent charge storage)

IT Battery cathodes  
(nonaq.  $\gamma$ -butyrolactone electrolyte  
secondary lithium batteries with  
excellent charge storage)

IT Group VIIB element compounds  
RL: DEV (Device component use); USES (Uses)  
(oxides, transition metal oxide cathode active  
materials containing; nonaq.  $\gamma$ -butyrolactone  
electrolyte secondary lithium  
batteries with excellent charge storage)

IT Alkaline earth oxides  
Group IIB element oxides  
Group IIIA element oxides  
Group IVA element oxides  
Group IVB element oxides  
Group VIII element oxides  
RL: DEV (Device component use); USES (Uses)  
(transition metal oxide cathode active materials  
containing; nonaq.  $\gamma$ -butyrolactone  
electrolyte secondary lithium  
batteries with excellent charge storage)

IT 52627-24-4P, Cobalt lithium oxide 149087-95-6P, Cobalt  
lithium tin oxide 642999-33-5P, Cobalt lithium magnesium  
zirconium oxide  
RL: DEV (Device component use); IMF (Industrial manufacture); PREP  
(Preparation); USES (Uses)  
(cathode active material; nonaq.  
 $\gamma$ -butyrolactone electrolyte secondary  
lithium batteries with excellent charge  
storage)

IT 14283-07-9, Lithium tetrafluoroborate  
RL: DEV (Device component use); USES (Uses)  
(electrolyte; nonaq.  $\gamma$ -butyrolactone  
electrolyte secondary lithium  
batteries with excellent charge storage)

IT 96-49-1, Ethylene carbonate  
RL: DEV (Device component use); USES (Uses)  
(solvent with  $\gamma$ -butyrolactone; nonaq.  
 $\gamma$ -butyrolactone electrolyte secondary  
lithium batteries with excellent charge  
storage)

IT 96-48-0,  $\gamma$ -Butyrolactone  
RL: DEV (Device component use); USES (Uses)  
(solvent; nonaq.  $\gamma$ -butyrolactone  
electrolyte secondary lithium  
batteries with excellent charge storage)

L60 ANSWER 30 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2005:451706 HCAPLUS Full-text

DOCUMENT NUMBER: 143:10533

TITLE: Secondary nonaqueous  
electrolyte battery

INVENTOR(S): Takeuchi, Takashi; Nagasaki, Akira; Yoshizawa,  
Hiroshi

PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd.,  
Japan

SOURCE: PCT Int. Appl., 57 pp.

## 10/594,489-266327-EIC 1700 SEARCH

DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005048380	A1	20050526	WO 2004-JP16653	2004 1110
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CN 1875505	A	20061206	CN 2004-80032047	2004 1110
KR 789081	B1	20071226	KR 2006-707766	2006 0421
PRIORITY APPLN. INFO.:			JP 2003-387160	A 2003 1117
			WO 2004-JP16653	W 2004 1110

ED Entered STN: 27 May 2005

AB The battery has a separator between a cathode and an anode and an electrolyte solution; where the cathode contains a cathode active mass, comprising a Li composite oxide:  $\text{Li}_x\text{Me}_{1-y-z}\text{Mg}_y\text{Zr}_z\text{O}_2$  [Me = transition metal element(s) excluding Ti, Mn, Y, and Zr; M = Mg, Ti, Mn, and/or Zn; L = Al, Ca, Ba, Sr, Y, and/or Zr; x = 1-1.05; y = 0.005-0.1 (but y = 0.005-0.5 when M is Mn); and z = 0-0.05]; and the separator consists of a stack of single-layer films, having a fine porous structure; where the single-layer film facing the cathode is made of polypropylene.

IT 372492-00-7, Aluminum cobalt lithium magnesium oxide (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>) 852333-28-9, Cobalt lithium magnesium zirconium oxide (Co<sub>0.94</sub>LiMg<sub>0.05</sub>Zr<sub>0.01</sub>O<sub>2</sub>)

RL: DEV (Device component use); USES (Uses)  
 (cathodes containing lithium composite oxides and  
 separators containing polypropylene for secondary  
 lithium batteries)

RN 372492-00-7 HCAPLUS

CN Aluminum cobalt lithium magnesium oxide (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>)  
 (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.98	7440-48-4
Mg	0.01	7439-95-4
Li	1	7439-93-2
Al	0.01	7429-90-5

RN 852333-28-9 HCAPLUS

## 10/594,489-266327-EIC 1700 SEARCH

CN Cobalt lithium magnesium zirconium oxide (Co0.94LiMg0.05Zr0.01O2)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Zr	0.01	7440-67-7
Co	0.94	7440-48-4
Mg	0.05	7439-95-4
Li	1	7439-93-2

IC ICM H01M004-48  
ICS H01M004-58; H01M004-02; H01M010-40; H01M002-16  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST secondary battery cathode  
lithium composite oxide; battery separator single  
layer film stack polyethylene  
IT Battery cathodes  
Secondary battery separators  
(cathodes containing lithium composite oxides and  
separators containing polypropylene for secondary  
lithium batteries)  
IT Secondary batteries  
(lithium; cathodes containing lithium  
composite oxides and separators containing polypropylene for  
secondary lithium batteries)  
IT 7782-42-5, Graphite, uses 9002-88-4, Polyethylene 9003-07-0,  
Polypropylene 144419-56-7, Cobalt lithium magnesium oxide  
(Co0.95LiMg0.05O2) 345664-05-3, Aluminum cobalt lithium oxide  
(Al0.01Co0.99LiO2) 372491-81-1, Aluminum cobalt lithium  
magnesium oxide (Al0.1Co0.89LiMg0.01O2) 372491-82-2, Aluminum  
cobalt lithium magnesium oxide (Al0.01Co0.96LiMg0.03O2)  
372491-83-3, Aluminum cobalt lithium magnesium oxide  
(Al0.01Co0.94LiMg0.05O2) 372492-00-7, Aluminum cobalt  
lithium magnesium oxide (Al0.01Co0.98LiMg0.01O2) 478814-69-6,  
Aluminum cobalt lithium magnesium oxide (Al0.05Co0.9LiMg0.05O2)  
489431-33-6, Aluminum cobalt lithium oxide (Al0.01Co0.98LiO2)  
721448-53-9, Cobalt lithium magnesium oxide (Co0.94LiMg0.05O2)  
852333-25-6, Aluminum cobalt lithium magnesium oxide  
(Al0.1Co0.85LiMg0.05O2) 852333-26-7, Aluminum cobalt lithium  
magnesium oxide (Al0.2Co0.79LiMg0.01O2) 852333-27-8, Cobalt  
lithium magnesium strontium oxide (Co0.94LiMg0.05Sr0.01O2)  
852333-28-9, Cobalt lithium magnesium zirconium oxide  
(Co0.94LiMg0.05Zr0.01O2) 852333-29-0, Calcium cobalt lithium  
magnesium oxide (Ca0.01Co0.94LiMg0.05O2) 852333-31-4, Barium  
cobalt lithium magnesium oxide (Ba0.01Co0.94LiMg0.05O2)  
852333-33-6, Cobalt lithium magnesium yttrium oxide  
(Co0.94LiMg0.05Y0.01O2) 852333-35-8, Aluminum cobalt lithium  
titanium oxide (Al0.01Co0.94LiTi0.05O2) 852333-37-0, Aluminum  
cobalt lithium zinc oxide (Al0.01Co0.94LiZn0.05O2) 852333-38-1,  
Aluminum cobalt lithium manganese oxide (Al0.01Co0.94LiMn0.05O2)  
852333-39-2, Aluminum cobalt lithium magnesium oxide  
(Al0.03Co0.92LiMg0.05O2) 852333-41-6, Aluminum cobalt lithium  
magnesium oxide (Al0.01Co0.91LiMg0.08O2) 852333-42-7, Aluminum  
cobalt lithium magnesium oxide (Al0.01Co0.84LiMg0.15O2)  
852333-43-8, Aluminum cobalt lithium magnesium oxide  
(Al0.05Co0.89LiMg0.06O2)  
RL: DEV (Device component use); USES (Uses)  
(cathodes containing lithium composite oxides and  
separators containing polypropylene for secondary  
lithium batteries)

REFERENCE COUNT: 26 THERE ARE 26 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

## 10/594,489-266327-EIC 1700 SEARCH

ACCESSION NUMBER: 2004:1020204 HCAPLUS Full-text  
 DOCUMENT NUMBER: 142:9225  
 TITLE: Nonaqueous electrolyte  
 secondary battery and  
 charge/discharge system thereof  
 INVENTOR(S): Watanabe, Shoichiro; Nagayama, Masatoshi;  
 Kuranaka, So  
 PATENT ASSIGNEE(S): Matsushita Electric Industrial Co. Ltd., Japan  
 SOURCE: PCT Int. Appl., 37 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
WO 2004102701	A1	20041125	WO 2004-JP6620	2004 0511
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
JP 2004342500	A	20041202	JP 2003-138849	2003 0516
CN 1735985	A	20060215	CN 2004-80011814	2004 0511
EP 1655793	A1	20060510	EP 2004-732213	2004 0511
R: DE, FR, GB				
US 20060194109	A1	20060831	US 2005-552920	2005 1011
KR 790270	B1	20080102	KR 2005-720899	2005 1103
PRIORITY APPLN. INFO.:			JP 2003-138849	A 2003 0516
			WO 2004-JP6620	W 2004 0511

ED Entered STN: 26 Nov 2004

AB The disclosed nonaq. electrolyte secondary comprises a pos. electrode composed of a pos. electrode mix layer, a neg. electrode composed of a neg. electrode mix layer, a separator or a lithium ion-conductive porous film interposed between the pos. electrode and the neg. electrode, and a lithium ion-conductive nonaq. electrolyte. The pos. electrode mix layer contains a pos. electrode active material composed of a lithium-transition metal composite oxide, and the lithium-transition metal composite oxide contains lithium, a transition metal and a metal other than the transition metal. The neg. electrode mix layer contains a neg. electrode active material composed of a carbon material. In the

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region where the pos. electrode mix layer and the neg. electrode mix layer face each other, the ratio (R: Wp/Wn) of the weight of the pos. electrode active material (Wp) contained in the pos. electrode mix layer per unit area to the weight of the neg. electrode active material (Wn) contained in the neg. electrode mix layer per unit area is 1.3-2.2. In the normal operation, the charging final voltage of this nonaq. electrolyte secondary battery is set at 4.25-4.5 V.

IT 372492-00-7, Aluminum cobalt lithium magnesium oxide  
(Al0.01Co0.98LiMg0.01O2) 405890-05-3, Cobalt lithium  
manganese nickel oxide (Co0.1LiMn0.45Ni0.45O2) 477700-15-5  
, Cobalt lithium oxide (Co0.99LiO2)  
RL: TEM (Technical or engineered material use); USES (Uses)  
(cathode active substance for lithium  
secondary battery)  
RN 372492-00-7 HCAPLUS  
CN Aluminum cobalt lithium magnesium oxide (Al0.01Co0.98LiMg0.01O2)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.98	7440-48-4
Mg	0.01	7439-95-4
Li	1	7439-93-2
Al	0.01	7429-90-5

RN 405890-05-3 HCAPLUS  
CN Cobalt lithium manganese nickel oxide (Co0.1LiMn0.45Ni0.45O2) (CA  
INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.1	7440-48-4
Ni	0.45	7440-02-0
Mn	0.45	7439-96-5
Li	1	7439-93-2

RN 477700-15-5 HCAPLUS  
CN Cobalt lithium oxide (Co0.99LiO2) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.99	7440-48-4
Li	1	7439-93-2

IC ICM H01M004-02  
ICS H01M004-58; H01M010-40; H01M010-44  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST lithium secondary battery electrode  
active substance ratio  
IT Battery anodes  
(lithium secondary battery;  
graphite as anode active substance for)  
IT Battery cathodes  
(lithium secondary battery;  
lithium transition metal oxides as cathode  
active substances for)  
IT Secondary batteries  
(lithium; charging voltage limites for)  
IT 7782-42-5, Graphite, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(anode active substance for lithium  
secondary battery)

## 10/594,489-266327-EIC 1700 SEARCH

IT 144419-56-7, Cobalt lithium magnesium oxide (Co0.95LiMg0.05O2)  
 372491-83-3, Aluminum cobalt lithium magnesium oxide  
 (Al0.01Co0.94LiMg0.05O2) 372492-00-7, Aluminum cobalt  
 lithium magnesium oxide (Al0.01Co0.98LiMg0.01O2)  
 405390-05-3, Cobalt lithium manganese nickel oxide  
 (Co0.1LiMn0.45Ni0.45O2) 405890-08-6, Aluminum lithium manganese  
 nickel oxide (Al0.1LiMn0.45Ni0.45O2) 422520-44-3, Lithium  
 manganese nickel titanium oxide (LiMn0.45Ni0.45Ti0.1O2)  
 477700-15-5, Cobalt lithium oxide (Co0.99LiO2)  
 478814-69-6, Aluminum cobalt lithium magnesium oxide  
 (Al0.05Co0.9LiMg0.05O2) 489431-33-6, Aluminum cobalt lithium  
 oxide (Al0.01Co0.98LiO2) 709654-46-6 719276-54-7, Aluminum  
 cobalt lithium magnesium oxide (Al0.01Co0.94Li1.01Mg0.05O2)  
 798575-07-2, Aluminum cobalt lithium magnesium oxide  
 (Al0.01Co0.94Li1.02Mg0.05O2) 798575-08-3, Aluminum cobalt  
 lithium magnesium oxide (Al0.01Co0.94Li1.03Mg0.05O2)  
 798575-10-7, Aluminum cobalt lithium magnesium oxide  
 (Al0.05Co0.85LiMg0.1O2) 798575-11-8, Aluminum cobalt lithium  
 magnesium oxide (Al0.02Co0.88LiMg0.1O2) 798575-12-9, Lithium  
 magnesium manganese nickel oxide (LiMg0.1Mn0.45Ni0.45O2)  
 798575-13-0, Lithium manganese nickel strontium oxide  
 (LiMn0.45Ni0.45Sr0.1O2)  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (cathode active substance for lithium  
 secondary battery)

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE  
 FOR THIS RECORD. ALL CITATIONS AVAILABLE  
 IN THE RE FORMAT

L60 ANSWER 32 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2004:796473 HCAPLUS Full-text

DOCUMENT NUMBER: 141:263471

TITLE: Cathode active material for nonaqueous  
 electrolyte secondary battery

INVENTOR(S): Takahashi, Takeshi; Oba, Takeshi; Fujino,  
 Kenji; Tokuno, Junichi; Morizaki, Masuhiro;  
 Kondo, Takeyuki; Seyama, Jun

PATENT ASSIGNEE(S): Nichia Corporation, Japan

SOURCE: Eur. Pat. Appl., 54 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
EP 1463132	A2	20040929	EP 2004-7076	2004 0324
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK				
JP 2005050712	A	20050224	JP 2003-282341	2003 0730
JP 2005123111	A	20050512	JP 2003-358885	2003 1020
JP 2005190900	A	20050714	JP 2003-432856	2003 1226
JP 2004311408	A	20041104	JP 2004-42699	2004 0219
TW 286849	B	20070911	TW 2004-93105565	

## 10/594,489-266327-EIC 1700 SEARCH

KR 2004084643 A 20041006 KR 2004-17292 2004  
 0303  
 US 20040229123 A1 20041118 US 2004-806206 2004  
 0315  
 CN 1532966 A 20040929 CN 2004-10007990 2004  
 0323  
 PRIORITY APPLN. INFO.: JP 2003-83806 A 2004  
 0325  
 JP 2003-282341 A 2003  
 0730  
 JP 2003-358885 A 2003  
 1020  
 JP 2003-432856 A 2003  
 1226

ED Entered STN: 30 Sep 2004

AB Disclosed is a pos. electrode active material for a nonaq. electrolyte secondary  
 battery having at least a lithium-transition metal composite oxide of a layer  
 structure, in which an existence ratio of at least one selected from the group  
 consisting of elements which may become tetravalent and magnesium is 20% or more on a  
 surface of the lithium-transition metal composite oxide. By use of this pos. electrode  
 active material, a nonaq. electrolyte secondary battery having excellent battery  
 characteristics, specifically, having excellent high rate characteristics, cycle  
 characteristics, low-temperature characteristics, thermal stability, and the like,  
 under the even more harsh environment for use can be realized.

IT 182442-95-1, Cobalt lithium manganese nickel oxide  
 RL: DEV (Device component use); USES (Uses)  
 (cathode active material for nonaq. electrolyte secondary  
 battery)

RN 182442-95-1 HCAPLUS

CN Cobalt lithium manganese nickel oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Co	x	7440-48-4
Ni	x	7440-02-0
Mn	x	7439-96-5
Li	x	7439-93-2

IT 642999-33-5P, Cobalt lithium magnesium zirconium oxide  
 756879-33-1P

RL: DEV (Device component use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (cathode active material for nonaq. electrolyte secondary  
 battery)

RN 642999-33-5 HCAPLUS

CN Cobalt lithium magnesium zirconium oxide (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	x	17778-80-2
Zr	x	7440-67-7

## 10/594,489-266327-EIC 1700 SEARCH

Co		x		7440-48-4
Mg		x		7439-95-4
Li		x		7439-93-2

RN 756879-33-1 HCAPLUS

CN Aluminum cobalt lithium magnesium zirconium oxide (CA INDEX NAME)

Component	Ratio	Component	Registry Number
O	x		17778-80-2
Zr	x		7440-67-7
Co	x		7440-48-4
Mg	x		7439-95-4
Li	x		7439-93-2
Al	x		7429-90-5

IC ICM H01M004-48

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT 7439-93-2, Lithium, uses 131344-56-4, Cobalt lithium nickel

oxide 177997-13-6, Aluminum cobalt lithium nickel oxide

182442-95-1, Cobalt lithium manganese nickel oxide

RL: DEV (Device component use); USES (Uses)

(cathode active material for nonaq. electrolyte secondary battery)

IT 116713-67-8P, Cobalt lithium titanium oxide 147683-99-6P, Cobalt

lithium zirconium oxide 187144-48-5P, Cobalt lithium magnesium

oxide 191025-46-4P, Cobalt lithium nickel zirconium oxide

642999-33-5P, Cobalt lithium magnesium zirconium oxide

756879-33-1P

RL: DEV (Device component use); SPN (Synthetic preparation); PREP

(Preparation); USES (Uses)

(cathode active material for nonaq. electrolyte secondary battery)

L60 ANSWER 33 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2004:78030 HCAPLUS Full-text

DOCUMENT NUMBER: 140:131122

TITLE: Nonaqueous-electrolyte  
battery with cathode containing  
plural lithium mixed oxides

INVENTOR(S): Ukawa, Shinsaku

PATENT ASSIGNEE(S): Sony Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 15 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004031165	A	20040129	JP 2002-186698	2002 0626

PRIORITY APPLN. INFO.: JP 2002-186698

2002  
0626

ED Entered STN: 30 Jan 2004

AB The claimed battery is equipped with a cathode containing LixCol-yMyO2 (M = Al, Mg, or Mn; 0 &lt; x ≤ 1; 0 &lt; y ≤ 0.5) and 0.1-50 weight% LixNil-zCozMyO2 (M = Al, Mg, or Mn; 0 &lt; x ≤ 1; 0 &lt; y ≤ 0.5; 0 &lt; z ≤ 0.5). The battery provides high capacity and tolerance for overdischarge.

IT 203005-82-7, Cobalt lithium manganese nickel oxide

## 10/594,489-266327-EIC 1700 SEARCH

(Co<sub>0.15</sub>LiMn<sub>0.05</sub>Ni<sub>0.80</sub>O<sub>2</sub>) 372492-00-7, Aluminum cobalt  
lithium magnesium oxide (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>)

RL: DEV (Device component use); USES (Uses)

(nonaq.-electrolyte battery with  
cathode containing plural lithium mixed oxides)

RN 203005-82-7 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co<sub>0.15</sub>LiMn<sub>0.05</sub>Ni<sub>0.80</sub>O<sub>2</sub>) (CA  
INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	0.15	7440-48-4
Ni	0.8	7440-02-0
Mn	0.05	7439-96-5
Li	1	7439-93-2

RN 372492-00-7 HCAPLUS

CN Aluminum cobalt lithium magnesium oxide (Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	0.98	7440-48-4
Mg	0.01	7439-95-4
Li	1	7439-93-2
Al	0.01	7429-90-5

IC ICM H01M004-58

ICS H01M004-02; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium nickel cobalt mixed oxide cathode nonaq battery

IT Secondary batteries

(lithium; nonaq.-electrolyte  
battery with cathode containing plural  
lithium mixed oxides)

IT Battery cathodes

(nonaq.-electrolyte battery with  
cathode containing plural lithium mixed oxides)

IT 142447-14-1, Cobalt lithium manganese oxide (Co<sub>0.98</sub>LiMn<sub>0.02</sub>O<sub>2</sub>)

193214-24-3, Aluminum cobalt lithium nickel oxide

(Al<sub>0.05</sub>Co<sub>0.15</sub>LiNi<sub>0.80</sub>O<sub>2</sub>) 195880-90-1, Cobalt lithium magnesium

nickel oxide (Co<sub>0.15</sub>LiMg<sub>0.05</sub>Ni<sub>0.80</sub>O<sub>2</sub>) 203005-82-7, Cobalt

lithium manganese nickel oxide (Co<sub>0.15</sub>LiMn<sub>0.05</sub>Ni<sub>0.80</sub>O<sub>2</sub>)

372492-00-7, Aluminum cobalt lithium magnesium oxide

(Al<sub>0.01</sub>Co<sub>0.98</sub>LiMg<sub>0.01</sub>O<sub>2</sub>) 649560-56-5, Aluminum cobalt lithium

magnesium oxide (Al<sub>0.01</sub>Co<sub>0.97</sub>LiMg<sub>0.02</sub>O<sub>2</sub>)

RL: DEV (Device component use); USES (Uses)

(nonaq.-electrolyte battery with  
cathode containing plural lithium mixed oxides)

L60 ANSWER 34 OF 34 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2003:778145 HCAPLUS Full-text

DOCUMENT NUMBER: 139:294649

TITLE: Active substance of positive  
electrode and nonaqueous  
electrolyte battery containing the  
same

INVENTOR(S): Shiozaki, Ryuji; Fujii, Akihiro; Inamasu,  
Tokuo; Nakagawa, Hiroe; Kozono, Suguru;  
Nukuda, Toshiyuki

PATENT ASSIGNEE(S): Yuasa Corporation, Japan

SOURCE: PCT Int. Appl., 60 pp.

CODEN: PIXXD2

## 10/594,489-266327-EIC 1700 SEARCH

DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003081698	A1	20031002	WO 2003-JP3691	2003 0326
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
AU 2003221171	A1	20031008	AU 2003-221171	2003 0326
EP 1469539	A1	20041020	EP 2003-712972	2003 0326
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
CN 1643714	A	20050720	CN 2003-806935	2003 0326
CN 1967914	A	20070523	CN 2006-10132268	2003 0326
US 20050019659	A1	20050127	US 2004-500819	2004 0707
PRIORITY APPLN. INFO.:			JP 2002-88229	A 2002 0327
			JP 2002-137870	A 2002 0514
			CN 2003-806935	A3 2003 0326
			WO 2003-JP3691	W 2003 0326

ED Entered STN: 03 Oct 2003

AB The pos. electrode active substance is composed at least of lithium (Li), manganese (Mn), nickel (Ni), cobalt (Co) and oxygen (O), and contains a double oxide of the chemical composition formula:  $\text{Li}_a\text{Mn}_b\text{Ni}_c\text{Co}_d\text{O}_e$  (wherein  $0 < a \leq 1.3$ ;  $b+c \leq 0.05$ ;  $0.6 \leq d < 1$ ;  $1.7 \leq e \leq 2.3$ ; and  $b+c+d = 1$ ). The nonaq. electrolyte battery comprises a pos. electrode containing the above active substance, a neg. electrode and a nonaq. electrolyte. The anode active substances give batteries exhibiting high energy d. and excellent high-rate discharge performance and, even when high-temperature charging is effected, suffering less deterioration of battery performance.

## 10/594,489-266327-EIC 1700 SEARCH

IT 214473-76-4, Cobalt lithium manganese nickel oxide  
 (Co0.9LiMn0.05Ni0.05O2) 477700-15-5, Cobalt lithium  
 oxide (Co0.99LiO2) 479624-33-4, Cobalt lithium manganese  
 nickel oxide (Co0.98LiMn0.01Ni0.01O2) 479624-34-5,  
 Cobalt lithium manganese nickel oxide (Co0.95LiMn0.02Ni0.02O2)  
 532934-03-5, Cobalt lithium manganese nickel oxide  
 (Co0.67LiMn0.16Ni0.16O2) 607744-37-6, Cobalt lithium  
 manganese nickel oxide (Co0.83LiMn0.08Ni0.08O2)  
 607744-38-7, Cobalt lithium manganese nickel oxide  
 (Co0.95LiMn0.04Ni0.01O2) 607744-39-8, Cobalt lithium  
 manganese nickel oxide (Co0.95LiMn0.01Ni0.04O2)  
 RL: DEV (Device component use); USES (Uses)  
 (anode active substance for nonaq electrolyte  
 batteries)  
 RN 214473-76-4 HCAPLUS  
 CN Cobalt lithium manganese nickel oxide (Co0.9LiMn0.05Ni0.05O2) (CA  
 INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.9	7440-48-4
Ni	0.05	7440-02-0
Mn	0.05	7439-96-5
Li	1	7439-93-2

RN 477700-15-5 HCAPLUS  
 CN Cobalt lithium oxide (Co0.99LiO2) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.99	7440-48-4
Li	1	7439-93-2

RN 479624-33-4 HCAPLUS  
 CN Cobalt lithium manganese nickel oxide (Co0.98LiMn0.01Ni0.01O2)  
 (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.98	7440-48-4
Ni	0.01	7440-02-0
Mn	0.01	7439-96-5
Li	1	7439-93-2

RN 479624-34-5 HCAPLUS  
 CN Cobalt lithium manganese nickel oxide (Co0.95LiMn0.02Ni0.02O2)  
 (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2	17778-80-2
Co	0.95	7440-48-4
Ni	0.02	7440-02-0
Mn	0.02	7439-96-5
Li	1	7439-93-2

RN 532934-03-5 HCAPLUS  
 CN Cobalt lithium manganese nickel oxide (Co0.67LiMn0.16Ni0.16O2)  
 (CA INDEX NAME)

## 10/594,489-266327-EIC 1700 SEARCH

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	0.67	7440-48-4
Ni	0.16	7440-02-0
Mn	0.16	7439-96-5
Li	1	7439-93-2

RN 607744-87-6 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co0.83LiMn0.08Ni0.08O2)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	0.83	7440-48-4
Ni	0.08	7440-02-0
Mn	0.08	7439-96-5
Li	1	7439-93-2

RN 607744-88-7 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co0.95LiMn0.04Ni0.01O2)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	0.95	7440-48-4
Ni	0.01	7440-02-0
Mn	0.04	7439-96-5
Li	1	7439-93-2

RN 607744-89-8 HCAPLUS

CN Cobalt lithium manganese nickel oxide (Co0.95LiMn0.01Ni0.04O2)  
(CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	0.95	7440-48-4
Ni	0.04	7440-02-0
Mn	0.01	7439-96-5
Li	1	7439-93-2

IC ICM H01M004-58

ICS H01M004-02; H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT Battery anodes

(lithium manganese nickel cobalt oxides as active  
substances for)

IT Secondary batteries

(lithium; anode active substances for nonaq  
. electrolyte type)

IT 214473-76-4, Cobalt lithium manganese nickel oxide  
(Co0.9LiMn0.05Ni0.05O2) 477700-15-5, Cobalt lithium  
oxide (Co0.99LiO2) 479624-33-4, Cobalt lithium manganese  
nickel oxide (Co0.98LiMn0.01Ni0.01O2) 479624-34-5,  
Cobalt lithium manganese nickel oxide (Co0.95LiMn0.02Ni0.02O2)  
532934-03-5, Cobalt lithium manganese nickel oxide  
(Co0.67LiMn0.16Ni0.16O2) 607744-87-6, Cobalt lithium  
manganese nickel oxide (Co0.83LiMn0.08Ni0.08O2)  
607744-88-7, Cobalt lithium manganese nickel oxide  
(Co0.95LiMn0.04Ni0.01O2) 607744-89-8, Cobalt lithium

## 10/594,489-266327-EIC 1700 SEARCH

manganese nickel oxide (Co<sub>0.95</sub>LiMn<sub>0.01</sub>Ni<sub>0.04</sub>O<sub>2</sub>)

RL: DEV (Device component use); USES (Uses)

(anode active substance for nonaq electrolyte  
batteries)

REFERENCE COUNT: 27 THERE ARE 27 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

# 10/594,489-266327-EIC 1700 SEARCH

## FULL SEARCH HISTORY

=> d his nofile

(FILE 'HOME' ENTERED AT 09:58:55 ON 29 JUL 2008)

FILE 'HCAPLUS' ENTERED AT 09:59:26 ON 29 JUL 2008

E US20070196736/PN

L1 1 SEA ABB=ON PLU=ON US20070196736/PN  
D ALL  
SEL RN

FILE 'REGISTRY' ENTERED AT 10:01:13 ON 29 JUL 2008

L2 3 SEA ABB=ON PLU=ON (372492-00-7/BI OR 477700-15-5/BI  
OR 866331-36-4/BI)  
D SCAN  
E 477700-15-5/RN  
L3 1 SEA ABB=ON PLU=ON 477700-15-5/RN  
D SCAN  
L4 72683 SEA ABB=ON PLU=ON (LI(L)O(L)M)/ELS(L)3-6/ELC.SUB  
L5 QUE ABB=ON PLU=ON 3/ELC.SUB  
L6 4104 SEA ABB=ON PLU=ON L4 AND L5  
L7 297 SEA ABB=ON PLU=ON L6 AND .01-9/CO  
L8 8 SEA ABB=ON PLU=ON (LI(L)O(L)CO(L)ZR(L)MG)/ELS(L)5/ELC  
.SUB  
L9 995 SEA ABB=ON PLU=ON (LI(L)O(L)CO(L)NI(L)MN)/ELS(L)5/ELC  
.SUB  
L10 3 SEA ABB=ON PLU=ON L2 AND L4  
L11 0 SEA ABB=ON PLU=ON L2 AND L8  
D SCAN L10  
L12 6 SEA ABB=ON PLU=ON (LI(L)O(L)CO(L)ZR(L)MG(L)M)/ELS(L)6  
/ELC.SUB  
D SCAN  
L13 5 SEA ABB=ON PLU=ON L12 AND (AL OR TI OR SN)  
D SCAN

FILE 'STINGUIDE' ENTERED AT 10:25:58 ON 29 JUL 2008

FILE 'REGISTRY' ENTERED AT 10:28:05 ON 29 JUL 2008

L14 24 SEA ABB=ON PLU=ON (LI(L)O(L)CO(L)ZR(L)MG(L)M)/ELS

FILE 'HCAPLUS' ENTERED AT 10:29:22 ON 29 JUL 2008

L15 13 SEA ABB=ON PLU=ON L13  
D L15 1-13 TI CC  
L16 14 SEA ABB=ON PLU=ON L12  
L17 48 SEA ABB=ON PLU=ON L10  
L18 25 SEA ABB=ON PLU=ON L8  
L19 6603 SEA ABB=ON PLU=ON L7  
L20 1237 SEA ABB=ON PLU=ON L9  
L21 43 SEA ABB=ON PLU=ON L14  
L22 25 SEA ABB=ON PLU=ON L21 AND L18  
D SCAN L1  
L23 237753 SEA ABB=ON PLU=ON "BATTERY CATHODES"+MAX/CT  
L24 13 SEA ABB=ON PLU=ON L23 AND L16  
L25 7511 SEA ABB=ON PLU=ON ((L15 OR L16 OR L17 OR L18 OR L19  
OR L20 OR L21 OR L22) OR L24)  
L26 7286 SEA ABB=ON PLU=ON L25 AND L23  
E SECONDARY BATTERIES+ALL/CT  
E SECONDARY BATTERY+ALL/CT  
E SECONDARY BATTERIES/CT 25  
L27 15324 SEA ABB=ON PLU=ON "SECONDARY BATTERY CATHODES"+MAX/CT  
L28 3110 SEA ABB=ON PLU=ON L27 AND L26  
L29 17 SEA ABB=ON PLU=ON L28 AND L18  
L30 200884 SEA ABB=ON PLU=ON "SECONDARY BATTERIES"+MAX/CT OR  
(SECONDA? OR LITHIUM OR LI)(2A)BATTER?

# 10/594,489-266327-EIC 1700 SEARCH

L31 QUE ABB=ON PLU=ON CATHOD? OR POSITIVE(A)ELECTROD?  
 L32 QUE ABB=ON PLU=ON "SECONDARY BATTERY ANODES"+MAX/CT  
 OR ANOD? OR NEGATIVE(A)ELECTROD?  
 L33 QUE ABB=ON PLU=ON ELECTROLYT?(2A) (NONAQ? OR NON(W)AQU  
 EOUS OR ORGANIC)  
 L34 5921 SEA ABB=ON PLU=ON L30 AND (L31 OR L23 OR L27) AND  
 L32 AND L33  
 L35 1321 SEA ABB=ON PLU=ON L26 AND L34  
 L36 11 SEA ABB=ON PLU=ON L35 AND (L18 OR L21)  
 L37 QUE ABB=ON PLU=ON LAYER?  
 L38 362 SEA ABB=ON PLU=ON L35 AND L37  
 L39 7 SEA ABB=ON PLU=ON L36 AND L37  
 E PARTICLES+ALL/CT  
 L40 QUE ABB=ON PLU=ON PARTICLES+MAX/CT  
 L41 4220 SEA ABB=ON PLU=ON (ZR OR ZIRCONIUM) (L) L40  
 L42 0 SEA ABB=ON PLU=ON L41 AND L38  
 L43 14 SEA ABB=ON PLU=ON L38 AND L40  
 D QUE  
 L44 QUE ABB=ON PLU=ON PARTICL? OR MICROPARTICL? OR  
 PARTICULAT? OR DUST? OR GRIT? OR GRAIN# OR GRANUL? OR  
 POWDER? OR SOOT? OR SMUT? OR FINES# OR PRILL? OR  
 FLAKE# OR PELLET?  
 L45 76 SEA ABB=ON PLU=ON L38 AND L44  
 L46 14 SEA ABB=ON PLU=ON L20 AND (L18 OR L21)  
 L47 0 SEA ABB=ON PLU=ON L46 AND L45  
 L48 4 SEA ABB=ON PLU=ON L46 AND L38  
 L49 4 SEA ABB=ON PLU=ON L46 AND L35  
 D QUE L29  
 L50 27 SEA ABB=ON PLU=ON L20 AND (L15 OR L16 OR L17 OR L18  
 OR L21)  
 L51 6 SEA ABB=ON PLU=ON L50 AND (L38 OR L45)  
 D SCAN  
 L52 16 SEA ABB=ON PLU=ON L17 AND L20  
 L53 16 SEA ABB=ON PLU=ON L52 AND L30 AND (L23 OR L27 OR  
 L31)  
 L54 12 SEA ABB=ON PLU=ON L53 AND L33  
 L55 40 SEA ABB=ON PLU=ON L36 OR L39 OR L43 OR (L48 OR L49)  
 OR (L51 OR L52 OR L53 OR L54)  
 L56 48 SEA ABB=ON PLU=ON L50 OR L55  
 L57 33 SEA ABB=ON PLU=ON L56 AND ((L15 OR L16 OR L17 OR  
 L18))  
 L58 16 SEA ABB=ON PLU=ON L56 AND L22  
 L59 33 SEA ABB=ON PLU=ON L57 OR L58  
 L60 34 SEA ABB=ON PLU=ON L56 AND ((L15 OR L16 OR L17 OR  
 L18) OR L21)  
 SAV TEMP L60 WEI459HCP/A  
 D QUE L60  
 D L60 1-34 IBIB ED ABS HITSTR HITIND